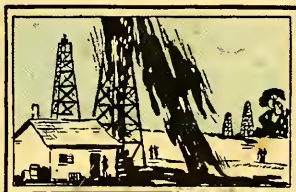


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Louisiana Conservation REVIEW



*Washington
Memorial Parkway*

* * *

*Converting Waste
Lands*

* * *

History of Oysters

* * *

*Tung Oil
Development in
Louisiana*



Published Monthly by the
DEPARTMENT OF CONSERVATION



MAY
1932

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VOL. II.

NEW ORLEANS, LA., MAY, 1932

NO. 8

A Census of Our Birds

AUDUBON came to Louisiana, studied its bird life, made drawings of its birds and as a result Louisiana bird life is world-famous. The Conservation Commission of Louisiana has now supplemented Audubon's masterwork by issuing its Bulletin No. 20 on the birds of Louisiana, the first publication which attempts to describe all of the birds of Louisiana. It embraces 598 pages, exclusive of the color-insert pages. Commissioner Robert S. Maestri has written the foreword. The data was especially gathered by Stanley C. Arthur, former director of the Wild Life Division, as well as by the Staff of the Department of Conservation.

Commissioner Maestri writes that he requested those compiling the publication to use as little scientific terminology as possible, in the hope that the book would be widely read, especially in the schools. He observes that teaching a love of birds to the school children is conducive to good citizenship. He hopes that Louisianians may, through this bulletin, learn to observe and care for our birds and know them as living things of beauty.

Fortunately for the general reader the text of the Bulletin follows this advice. The love of birds is almost universal. Not only will bird lovers take pleasure in reading the bulletin, but for the most part it is so simply written that it will be understandable to children as well as grown-ups.

Public and private libraries, both in Louisiana and elsewhere will be interested in this book, for Louisiana is one of the recognized bird centers of the world.

Partly because the Conservation Commission of Louisiana has protected bird life, the state offers better opportunities for the study of birds than does any other state in the Union. We are on the main line of bird migration north and south. Audubon did his work here because this state offered the best place for the study of birds in his time.

Aside from the great commercial value of birds as insect destroyers there is another value to the state in the conservation of bird life. It offers the young folks a chance to study birds

Louisiana Conservation Review

Published monthly by the Department of Conservation in the interest of protection and proper utilization of Louisiana's natural resources.

JAMES P. GUILLOT Editor
N. E. SIMONEAUX Assoc. Editor
WM. G. RANKIN Business Mgr.

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at first hand in the great outdoors. The Item and Tribune hope to present in extended space in some future Sunday issue, illustrations and excerpts from the text of this new bulletin on the birds of Louisiana. It hopes that some opportunity for study and review of this book may be found in the public schools of Louisiana, and that our private schools and colleges will call the publication in whole, or part, to the attention of the children and young people of the state.

Good roads and automobiles are going to take future generations outdoors. A general popular knowledge of bird life will add greatly to the interest of travel and of outdoor life in Louisiana.

Forest Planting in U. S. Gained 24% in 1930

New Record for Acreage Reforested
Established During Year—Plant-
ing Amounted to 138,970 Acres—
Louisiana's Share 6,556 Acres

FOREST planting by all agencies in the United States amounted in 1930 to 138,970 acres, a gain of 24 per cent over 1929, according to completed reports of 43 states and territories made public by the Forest Service, U. S. Department of Agriculture. The year's planting brought the cumulative record of all lands reforested in the United States to 1,798,048 acres. Federal, state, municipal and private plantings all made substantial gains despite drought and adverse economic conditions.

Other than the federal and state governments, 19,161 agencies and individuals participated in forest planting, which set the new record for acreage reforested. Of the more than 17,000 individuals, about four-fifths were farmers.

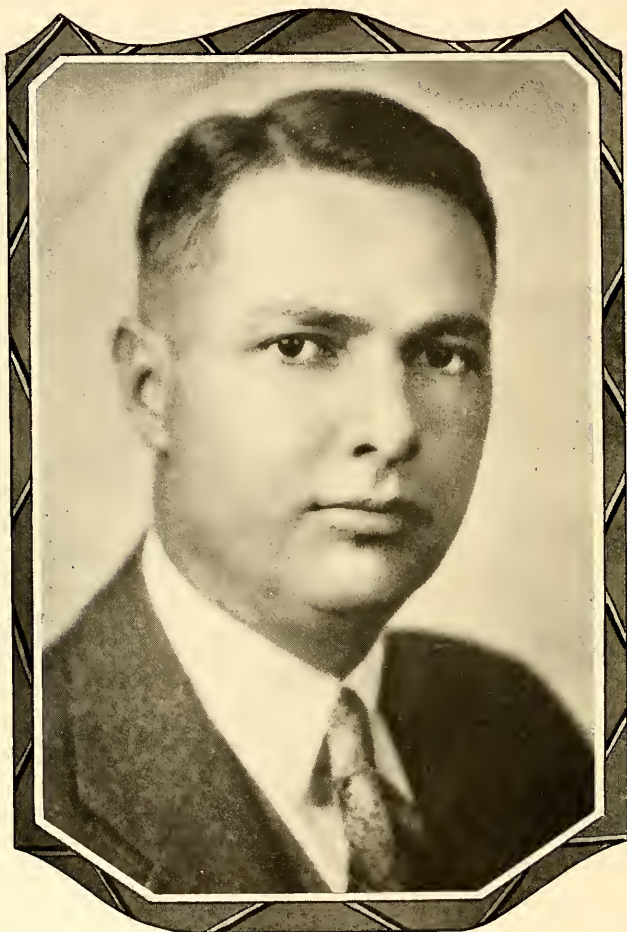
U. S. Forest Service plantings on the National Forests totaled 21,678 acres, 19 per cent more than the year preceding.

State forestry department plantings in 1930, amounted to 41,038 acres, a gain of 30 per cent over 1929. Plantings by municipalities aggregated 6,244 acres, an increase of 56 per cent. Industrial organizations planted 30,230 acres, a gain of 20 per cent, and organizations of other types, with 2,513 acres planted, gained 66 per cent. Schools and colleges put out 825 acres of trees, 53 per cent more than the year before. Individual plantings jumped from 28,475 to 33,467 acres, a gain of 17 per cent.

The year's totals showed important progress and interest in renewing forest resources and putting idle lands to growing timber crops, although planting has never yet kept pace with losses through wasteful cutting, forest fires and erosion, according to the Forest Service.

Michigan led all the states in acreage reforested for 1930, with a grand total of 38,302 acres planted by all public and private agencies. Of this area, the

(Continued on page 18)



HON. ALVIN O. KING
Governor of Louisiana

PROCLAMATION

STATE OF LOUISIANA
EXECUTIVE DEPARTMENT
BATON ROUGE, LA.

Whereas, the relation and importance of bird life to the common welfare, and especially to the agricultural interests, is a subject deserving more general recognition; and

Whereas, statistics show that the loss to agriculture by insect pests amounts yearly to more than \$1,300,000,000 and that one-tenth of everything raised for food is destroyed by insect pests; and

Whereas, the human race is fighting the insect world for control of the earth; and

Whereas, we know that birds are the natural enemies of all forms of insect life, and that if we could increase the number of birds, we would have less trouble with these insect pests; and

Whereas, the decrease in bird life in our State and of the nation is one of the causes for the increase of the numerous pests which are costing the farmers of this country millions of dollars annually; and

Whereas, the preservation of bird life must come in a large measure through instilling in the minds of the school children of the State a love of nature and a knowledge of her benefactions,

Now, Therefore, to the end that the public schools and all societies, as well as individuals, may co-operate in the work of saving the birds of the State, and to bring the subject of bird conservation before the people,

I, Alvin O. King, Governor of the State of Louisiana, do hereby designate and appoint Friday, April 8, 1932, and hereafter the second Friday in April as BIRD DAY, and I hereby request that all teachers of public schools and the people generally shall observe the same with appropriate exercises, that the value of birds may be better recognized and bird life studied.

In Witness Whereof, I have hereunto set my hand and caused the Great Seal of the State of Louisiana to be affixed.

Done at Baton Rouge, the Capital, this 7th day of April, A. D., 1932.

(Signed) ALVIN O. KING,
Governor

ALICE LEE GROSJEAN,
Secretary of State

PROCLAMATION

STATE OF LOUISIANA
EXECUTIVE DEPARTMENT
BATON ROUGE

Whereas, The Congress of the United States has, by joint resolution, requested the President of the United States to proclaim annually that May Day is Child Health Day;

Whereas, President Hoover has issued a proclamation requesting the Governors of the States of the Union and of territories and possessions of the United States to declare to their people that May Day shall be used wherever possible as Child Health Day; and

Whereas, It is one of the highest duties of parents, school executives, teachers, and all others interested in the welfare of the people to throw every possible safeguard around the physical welfare of children, with the view of giving every child the opportunity to develop into strong physical manhood or womanhood;

I, Therefore, issue this my proclamation, calling upon all educational institutions, both public and private, in Louisiana to dedicate May Day as Child Health Day and to make arrangements for suitable exercises, calling attention to the importance and necessity of promoting good health among all children with the safeguard essential to their proper physical development. The co-operation of superintendents, school boards, principals, teachers, and the public is earnestly requested in order that the purposes of this proclamation may be realized, thereby advancing the happiness of thousands of children, as well as economic and social well-being of the State.

In Testimony Whereof, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Louisiana, at the Capitol, in the City of Baton Rouge, on this, the seventh day of March, A. D. 1932.

ALVIN O. KING,
Governor.

By the Governor:
ALICE LEE GROSJEAN,
Secretary of State.



Where the road ends—the George Washington Memorial Parkway will end at this famous point,—the Great Falls of the Potomac—running from Mount Vernon past the City of Washington, traversing the high cliffs along both sides of the River and through virgin woods, saturated with early American history.

The George Washington Memorial Parkway

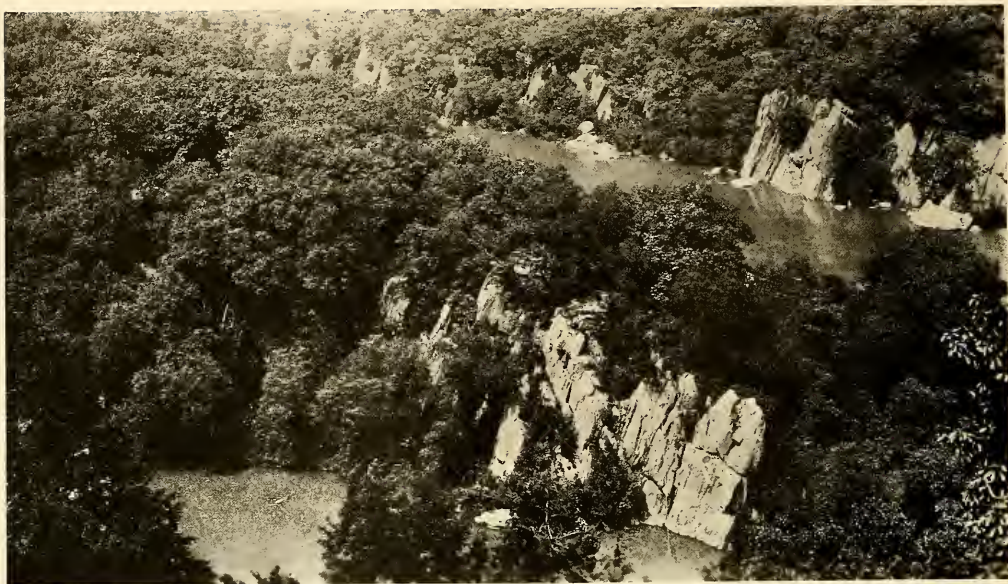
By CLARENCE PHELPS DODGE

(Courtesy, American Forests, Washington, D. C.)

THESE are numerous rivers in the United States, the fame and romance of whose waters have often been sung in poem and story and whose historic character is well known. But what of the Potomac? What is really known of this river, except that on its banks is situated the Capital of the United States and that Mt. Vernon, the lovely home of the immortal Washington, overlooks its waters as they flow silently by on their way to Chesapeake Bay? How many know that the Potomac River has played a greater part in history than any other river in the land? So little has been written of the varied and superb scenery along its banks that outside of a few scientists and nature lovers the plant and animal life on the islands and on both shores of the river's upper reaches have scarcely been realized.

This year of 1932, in which the Bicentennial of George Washington is celebrated, is a most

fitting time to spread throughout the land the knowledge of the Potomac, a river identified with the life of the first President and so influential in aiding to shape his character—calm and progressing quietly as it passes Mount Vernon, it gave of its serenity and beauty to mould the character of the first President. About thirty miles up-stream where the river runs through a wild gorge, it gave of its ruggedness and courage to aid in contributing something which helped the General of the Revolutionary forces to meet and conquer the vicissitudes of Valley Forge. Yes, it is very strange that the Potomac River is so little known and understood. It would seem as if it had preferred in these two hundred passing years to submerge its identity so that greater honor could be given to George Washington, Mount Vernon and the National Capital itself. But now the Potomac is to come into its own,



In the rugged gorge of the Potomac—here the finger of history has written thrilling chapters in the subduing of the red men in the saga of early America.



In striking contrast to the precipitous cliffs and rough waters of the gorge is this view of the River as it runs smoothly past the Capital City on its way to the Chesapeake, passing the Nation's Shrine at Mount Vernon—the route of the great Memorial Parkway. The Lincoln Memorial is seen in the distance.

A small group of men and women have caught a vision—they have realized the value the river possessed in the early life of the nation. But better still they have sensed the beauty and power of the Potomac to serve all the people through its calmness and beauty and also through its strength and ruggedness. Not only did these men and women look into the past and recognize the worth of the river's history, but their vision was great and clear enough to see far down the coming years and understand. As a result, a movement is now under way to make easily ac-



Looking toward Washington from near Great Falls—seen from the air. In undisturbed beauty the historic Potomac winds its way between the verdant hills of Maryland and Virginia.

cessible the historic richness, the superb scenery, the scientific value and the recreational possibilities of the Potomac. It is planned to build a parkway along the river in memory of George Washington to extend from Mount Vernon up to Great Falls on the Virginia side, at that point to bridge the river and return to Fort Washington on the Maryland side—a total distance of fifty-six miles.

The George Washington Memorial Parkway

has been designed by the National Capital Park and Planning Commission to include public control of both banks of the Potomac River between Mount Vernon and Great Falls on the Virginia side and between Fort Washington and Great Falls on the Maryland side, with the exception of areas at the City of Alexandria, and in Washington, which are reserved for commercial development. This will make possible the preservation for the public of the scenic and historic sites along the Potomac from Mount Vernon, where Washington lived, past Alexandria, Arlington, and the National Capital, which he founded, and to Great Falls, where the Patowmack Canal Lock, built under his personal direction and from plans prepared by him in 1786, showed his skill as an engineer.

Congress has provided that federal appropriations may be expended by the National Capital Park and Planning Commission for any unit of the George Washington Memorial Parkway upon receipt of



"And the trees were reflected in the waters of the Potomac." Quiet sanctuaries such as this may be found anywhere along the reaches of the upper river.

"definite commitments" from the states bordering the parkway or political subdivisions thereof, or from other responsible sources, for one half the cost of acquiring the land. The sum of \$7,500,000 has been authorized by Congress for this work, \$1,000,000 of which has already been appropriated and made available for land purchases when cooperation as provided by the Capper-Cramton Act is forthcoming.

The Federal Government will maintain and police the parkway as it is developed. This development will make possible the restoring of many historical sites.

The project is of such nation-wide interest that an organization

tion of nature. Tree lovers will have an especial interest in the trees of the Potomac River Valley along and adjacent to the proposed parkway.

According to Oliver M. Freeman, of the Department of Agriculture, more than eighty-five kinds of trees grow along the Potomac and adjacent hills from Great Falls to Mount Vernon. Many of the species are restricted to certain types of soil while others are generally found throughout the area. In the rich alluvial soil below Great Falls are found sugar maples together with other plants which do not grow well in the hotter and dryer conditions below Washington. The Can-

ada hemlock forms imposing masses of dark green foliage in the



The woods through which the Parkway passes are noted for their rich variety of native flowers and ferns, a few of which are shown. Upper—left to right: columbine, dogtooth violet or trout lily, and wild rhododendron, followed by luxuriant ferns and trailing arbutus.

has been chartered known as the George Washington Memorial Parkway Association, Incorporated, with the objective of forming a chapter in the District of Columbia and state chapters throughout America for the purpose of informing the people concerning the beauties of the Potomac and enlisting their interest in the proposed parkway.

Americans are a nature loving people. Each year thousands of young people are learning to use their eyes and ears with understanding as the bird and animal life together with the tree and plant life is brought to them through the National Parks and National Forests. The George Washington Memorial Parkway will pass through a region rich in all that makes for a real apprecia-

ravines chiseled out by the streams which enter the river below the falls, especially along the Virginia shore.

Throughout the valley the stately tulip trees are ever present, although in many places the larger specimens have been cut for their valuable lumber. The dozen or more species of oak make an interesting group and show preference to soil and moisture conditions. The dry rocky hills in the vicinity of Great Falls are the home of the rock chestnut oak while in the lower ground down the river can be found the willow oak, shingle oak and basket oak. It is of special interest that locally the valley of Rock Creek is the southeastern natural range limit of the shingle oak. On the dry gravelly ridges below Washington is to be found

the blackjack oak, while the white and post oaks are likely to be seen anywhere from Great Falls to Mount Vernon. The lover of trees will be especially interested in the towering American plane trees along the river banks vieing with the American elms and hackberry for a place in the sun. Other trees which grow well along the river bank are the boxelder, silver maple and river birch. Besides the American elm another smaller species, the slippery elm, is found along the upper Potomac. This species, interesting in the winter and early spring, with its large cinnamon-brown flower buds, issues a delightful fragrance when its leaves dry.

Magnificent specimens of the American beech are common along the wooded hills and in the valleys on both sides of the river. The American hornbeam which commonly grows along the river bank and near the tributary streams has an interesting relative, the American hop hornbeam, which prefers the higher rocky places. This latter tree is named from its fruits which are strikingly similar to those of the true hop. Four species of hickories are found in the region and both the black walnut and butternut are fairly common. The pecan, although not native to the region, has been planted and at least one specimen of large size is known. In addition to the oaks mentioned, the pin, red, scarlet, black, southern red, swamp white, and other oaks help to beautify the landscape. With such a variety of trees in the Potomac River Valley, every season of the year has its particular interest. Few people realize the full beauty of the winter woods, nor the real opportunity that season affords for the study of trees. During the fall the foliage coloring is particularly attractive near the steep river banks in the vicinity of Great Falls and along the rocky gorge below. The brilliant red of the tupelo, the reds and browns of the oaks, the yellow and red tints of the maples and sweetgum form a glorious panorama. The abandoned fields and pastures with their scrub pines and red cedars lend an interesting touch to the landscape. In the spring the area is changed to a fairyland with the blooming of the redbud and flowering dogwood.

Space does not permit the mention of many other interesting trees in the valley, but some of the more outstanding species are the American linden, American holly, common locust, black cherry, osage-orange, papaw, sassafras, shad-blow, black willow and largetooth aspen. Some interesting introduced trees which have established themselves are the Babylon weeping willow, white poplar, white mulberry, empress-tree, bird cherry and ailanthus.

With the discussion of trees, it seems desirable to mention some of the more interesting shrubs. Sweetfern, mountain-laurel, witch-hazel, fragrant sumac, book euonymus, wahoo and leatherwood can all be found in the area above Washington. In streams and wet places along the river, the buttonbush with its spherical heads of white flowers grows to perfection. Another shrub or small tree which deserves special mention is the white fringetree which has large panicles of fragrant flowers followed in the fall by olive-like blue fruits.

Future visitors to Washington and Mount Vernon will have a treat in store for them as the new highway will give easy access to this natural woodland where trees older than the city of Washington can be seen.

Plummers Island, the headquarters of the Washington Biologists' Field Club, is unquestionably the most famous sylvan area in the entire scenic valley of the Potomac between Great Falls and Mount Vernon. The scene of intensive biological studies by many of Washington's most prominent naturalists, it also has become the mecca for the serious student of nature from afar.

The valley of the Potomac has been intimately associated with the work of experts of the Department of Agriculture and the Smithsonian Institution for seventy-five years or more, during which time valuable and authoritative reports have been prepared and published, dealing with the flora, insects, reptiles, fishes, birds and mammals. Until the last few years the "Washington Region" of the naturalists included the territory within a radius of about twenty miles of the Capitol, and so extended nearly to Great Falls and Mount Vernon. In the area of the main valley or its wooded and rocky tributaries the hiker or casual visitor would be almost sure to encounter some naturalist armed with insect net, collecting pistol, or field glass and notebook.

The valley of the Potomac has in comparatively recent years achieved an added importance affecting both naturalist and sportsman, because of the great numbers of ducks that every winter congregate in the region below Washington. While most of the birds are usually observed below Mount Vernon, they frequently move up the river and sometimes "rafts" numbering tens of thousands are to be seen a short distance off Hains Point. At a time when the future of these birds seems threatened, it is almost prophetic that they should gather in the shadow of the Capitol as though appealing for summer and winter refuges where they may live in peace.

(Continued on page 31)

Possibilities of Converting Waste Lands

Fishing Grounds and Swimming Pools may be Created by Damming Springs, Branches and Building Lakes

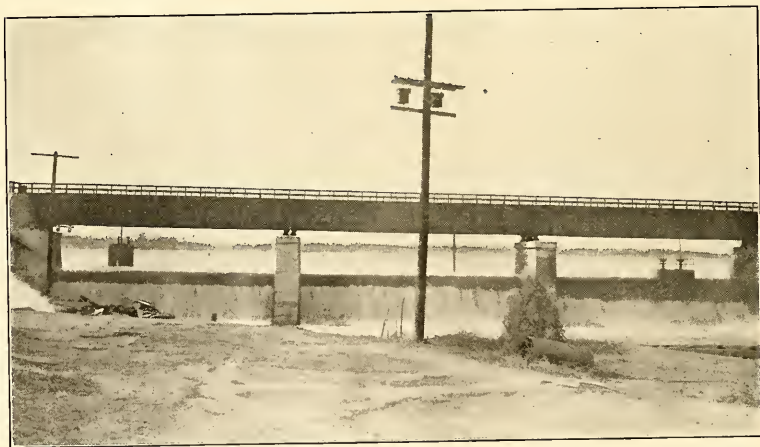
IN THESE days of drift from the country to the cities, it behooves the country to use all of its advantages, not only to be attractive but to afford sustenance and recreation for the people who choose to live in the country. To this end, the writer believes that the creeks and spring branches that drain our upland country of Louisiana are one of our greatest unused assets. If they were properly utilized by the simple method of building dams with spillways across the streams so as to form small lakes, this would make fishing possible (if stocked with fish) and at the same time make excellent swimming pools for the young people during the summer time when the long hot days afford time for such recreation. Lakes also make attractive picnic grounds for community gatherings, as water and boats always add to any spot where people gather for an outing. We know of several lakes built near Shreveport, Louisiana, by individuals who have country homes where they

By B. W. MARSTON

go over the week-ends to enjoy the quiet and peace of the country away from the activity of the city.

These small lakes cover usually from 50 to 100 acres according to the lay of the ground and the height of the dams that are the determining factors as to size of the lakes when filled with water. There are usually one of two situations necessary in locating a dam site to build a lake: Either find a natural pond that is fed by springs, and enlarge its circumference and depth by damming its outlet, or else build a dam across a small stream that will hold water to its bank-full level and back up a sufficient distance to provide a large enough body of water. In the earlier days every neighborhood had a dam site where the old water wheel furnished power to grind the corn meal and incidentally the boys used it for a swimming hole and angled a few perch out of it at favorable times. More lakes are built, however, by utilizing a cove or natural pond which

nature has partly made to order. In this instance, the first consideration would be a sufficient water-shed (probably fed by springs), so it would not go dry in the summer time when evaporation is greatest. Building the dams with sufficient spillways is also all-important as these dams are easily washed out by sudden freshets. The usual method after locating the site (on the lowest ground) is to build the spillway of concrete of sufficient length to



A view of the spillway of Cross Lake at Shreveport, La. This lake has a circumference of 27 miles and is the main water supply for the City of Shreveport. It is one of the finest fishing grounds in North Louisiana. There is an average of 75 to 100 people fishing therein daily during nine months of the year. It is closed for three months during the spawning season.

let out the surplus water. After the spillway is built the ends of the dam can be built of earth extending from the spillway to the high ground forming the sides of the lake.

It is also desirable to have some kind of gate in the dams so the lake can be drained to a very low level every few years, as it is necessary to clear out the turtles and undesirable fish that will in some way find their way into these artificial lakes.

Moreover, we are told that a few bass will grow to a very large size, and a very few of them will consume all of the small fish before they can grow into eatable size. In a number of instances where the fishing has "played out" and the lakes were drained, it was found that there were only a few large bass left, bearing out the theory that the big fish will eat the little ones.

The lake, of course, should be built where it will have sufficient depth (not less than ten feet in the deepest place), else the water will get stagnant. Lake owners tell us it is undesirable to have water-lilies as they will soon spread over the lake, but cat-tails and willows around the edges will furnish shade for the fish and fishermen.

If it is desirable to build a small lake by damming a stream, a site must be found where the situation furnishes the most advantages, usually where a maximum amount of water can be impounded with the least amount of work and expense on the dam. Frequently there are narrow places in these small streams where the banks are high, necessitating only a short high dam to give deep water. In the olden days the old water mill dams were built of timbers where there was no stone or concrete. The writer remembers when he was a lad going with his father to an old mill dam in East Feliciana Parish for a fish fry. On this occasion the men put seines across the mouths of small lateral arms running into the main stream, after which the owner of the mill opened the gates of the dam and lowered the water until the stream was almost drained. The seines trapped all the fish that could not pass, leaving at least fifty pounds of perch and bass



Private lake owned by Mr. Ed. Dickinson of Shreveport, La., covering approximately 75 acres and very prolific of game fish.

behind each of the seines. Rather a wanton waste, but I remember well the great quantity of fish that was caught, and I am sure that in this day and time such a supply of fish would be highly appreciated both for the sport of the angler and the food value.

These clear sandy bottom creeks are numerous in the Florida parishes and all over the hill section of North Louisiana where the possibilities are obvious.

The cost of constructing a dam should not be so great now that there is cheap labor and material, and if permanently built the lakes would pay dividends over a long period of time in attractiveness and general interest to a community.

It may be practicable to form clubs in rural neighborhoods so as to lighten the expense. Small towns too could afford, if properly situated, to build a lake and let the municipality own it, in the same manner that larger cities maintain parks and playgrounds, provided the expense isn't too great.

The outstanding example of "made lakes" in Louisiana are: Cross Lake near Shreveport, Cane River near Natchitoches, and the new Saline Lake (when it is completed) near Winnfield. These lakes have converted unsightly waste places into play grounds of inestimable value as well as furnishing an inexhaustible supply of fresh water during the dry seasons of the year.

It is has been said that an acre of water will grow more food for people in the form of fish than an acre of good ground. If this be true, Louisiana and our southern states have many acres they could utilize to good advantage.

OYSTERS

A Little of Their History

ACCORDING to the latest records the oyster fishery in the United States is second in value only to the salmon fishery. It is conducted in every sea-coast state from Cape Cod to the Rio Grande and from Puget Sound to San Francisco. The annual yield is about 63,000 tons of food as prepared for consumption, an equivalent of 210,000 dressed steers. The annual production as it comes from the water is valued at more than \$17,000,000.

In Europe the oyster is, and long has been, a luxury enjoyed by the few. When the first settlers came to the shores of America, one of the most impressive indications of the richness of the new land was the great abundance, large size, and excellence of the oysters that they found. Under these conditions, and at a time when the infant communities necessarily were dependent in a great measure on natural products for food, this readily obtainable and delicious shellfish came into common use as an important element of their diet. Even before the



The Incomparable Louisiana Oyster.

white men came the Indians of the coast subsisted largely on oysters, and, it is said, used them in a dried and smoked state, strung on twigs, as an article of barter with their inland neighbors. At many places great mounds of shells deposited in prehistoric times tell of the free use that the red men made of oysters, and on the Damariscotta River in Maine, where none are now found, there is a mound containing about 7,000,000 bushels of shells.

The early white settlers, like the Indians, relied on the supposedly inexhaustible natural beds; but in the older and more densely populated parts of the country, particularly on the New England coast, where the natural beds were less extensive than further south, the almost universal use of

this popular shellfish by the coastal population showed many years ago that nature, in many cases wantonly abused by wasteful methods, could not keep up the supply unaided. It was obvious that lest the supply should fail, at least locally, man himself must lend a hand much as he had in raising land crops.

The oyster, as most persons know it, like that stolid vegetable, is attached to is as immobile as the turnip, and, the soil, although not by roots; but in its infancy it swims freely, though feebly, and before it settles down may wander far from the parental locality. The embryo oyster, which forms after



The Louisiana Oyster Grows Rapidly.

Given favorable conditions and proper cultivation, from 20 to 25 months are required to bring the Louisiana Oyster to the degree of size and excellence necessary to make it a marketable commodity.

the egg is discharged into the water by the mother, is so small as to be just visible to the unaided human eye. This embryo soon becomes covered with microscopic fleshy bristles, which, beating in unison, give it some power of locomotion, although they are serviceable chiefly in suspending it in the water and bringing it within reach of the tidal currents, which waft it afar.

After a brief career of travel a tiny shell begins to form, and as the burden of this increases a change of habit comes. The little oyster must attach itself to a support and settle down to the sedentary life of the adult, and this necessity brings one of the gravest crises of its life. It is hardly visible without a lens, the thinnest film of sediment will cover and stifle it, and most of the bottom over which it has been swimming is muddy. Only oyster beds, gravel and shells, piling, and similar bodies in the water present a surface sufficiently firm and clean to serve the little oyster's purpose. The more fortunate ones cement their shells to such objects, grow, and henceforth remain where they fell unless displaced by some external force; but for each one that becomes so attached there are unknown myriads that fall on unsuitable surfaces and perish. This is one reason why it is necessary for the female oyster to produce millions of eggs that her kind shall not disappear from the waters.

The men who first undertook oyster culture in America did not know these things, nor many other interesting facts of the oyster's life; but they had observed that almost any hard-surfaced objects falling into the water, if they did not become engulfed in the mud, became coated with a growth of oysters, and they reasoned that such materials purposely placed on barren bottoms would establish artificial oyster beds, and that to the man who made the deposit belonged the oysters.

Thus began, through the initiative of the oystermen themselves, the practice of oyster culture

in the United States, which has developed until at the present time 43 per cent of the oysters produced in the country and 56 per cent of the total value of this product are derived from artificial beds, privately owned or leased from the states.

Beginning in shoal waters alongshore, the oyster growers have extended their operations into the deep open waters of Long Island Sound and Chesapeake Bay and to every coastwise state from Massachusetts to Texas and from Washington to California, and the few small boats first

employed, propelled by sails or oars, have given place to fleets of motor boats and steamers.

Between the planting and the harvest, an interval from two to five years, the oyster culturist assumes many hazards. On the New England coast, after all his material is down, the fickle "set" may not appear, possibly because at the critical time some weather disturbance may



Oyster Bed at Low Tide.
From this it may be seen how, in the old days oysters were gathered without the aid of tongs.

have killed the baby oysters while they were yet swimming near the surface. In the Gulf of Mexico the "set" may be so heavy that there is scant room for the oysters to grow, and many die while those that are left are half starved and misshapen from crowding. Even when the little oysters or "spat" have attached themselves in favorable numbers their perils have just begun. They are never safe from other enemies until they fall into the hands of their arch foe, man. Schools of drumfish may grind them into fragments between teeth arranged like a cobblestone pavement, and so the oyster grower's crop may melt away, almost in a night. Starfish often appear in great hosts, and by the muscular force of their arms, furnished with rows of suckers, rend open the shells and turning their own stomachs inside out absorb the oyster while it still lies within the armor designed to protect it. The drill, a little marine snail, uses its rough tongue like a rasp and, boring a smooth round hole through the helpless oyster's shell, inserts its snout and licks up the delicious meat within.

Freshets from the land and storms rolling in from the sea take their toll—the one by rendering the water too fresh or too muddy and the other by the force of the waves tearing up both oysters and the bottom. Even with their own species these mollusks have to contend, and numbers uncountable die in the warfare. They struggle with their kind as man struggles with man, for room to grow and enough to eat; and though the struggle is passive it is relentless, and the loser, unable to run away, is starved or stifled through lack of room in which to open its shell for food and oxygen.

The oyster feeds on small particles suspended in the water, conspicuous among which by reason of their beauty under the microscope are minute plants, called diatoms, covered with ornately sculptured transparent shells of quartz. These and the other food particles are carried by the currents, dropping to the bottom in a gentle drizzle and eventually accumulating in considerable deposits. Each oyster has part of its surfaces covered by innumerable microscopic, vibrating, fleshy bristles, each feeble in itself, but, beating in unison, producing currents strong enough to carry the food particles into the gaping shell, where the water passes through the gills, which are beautifully constructed delicate sieves, and thence again to the outside, while the food strained from it passes in a constant stream into the mouth. So industrious is the oyster and so scattered is its food that to get its daily meal it filters about 35 quarts of water, making useful to man a wealth of microscopic material which otherwise would be lost. The waste of the soils, washed by rains and carried into the sea, comes back, indirectly, through the marine plants that are nourished by the fertilizing salts and fed on by the oyster.¹

As a food the oyster is one of the greatest delicacies obtained from the sea. If its natural food be abundant and the beds not too crowded, the oyster becomes fat, luscious, and tender. In this condition it is easily digested, nutritious and wholesome, and is rich in elements of importance in our diet. Its composition is of such character as to make it more nearly than most food self-sufficient as a diet. In this respect it resembles milk and needs but the ordinary ingredients used in cooking—starches and fats—to give it "balance." One pound of oysters will furnish 7 per cent of the energy a man needs daily, 28 per cent of the protein, 35 per cent of the calcium, 53 per cent of the phosphorus, and 136 per cent of the iron. Recent investigators have shown that raw oysters contain an abundance of vitamin C, an essential element in our food for preventing

scurvy, and stress the fact that "in general, civilized man, especially when living in cities, by reason of his food, which is composed almost exclusively, especially in winter, of that which is cooked, is bordering upon the phenomenon of deficiency." It behooves him to seize every occasion that offers itself to consume raw food, rich in vitamins. Mollusks, and oysters in particular, are from this point of view a most valuable resource.

Recent investigations by the Bureau of Fisheries disclose that "oysters, clams, and lobsters contain more iodine than other marine food with the exception of marine algae, which unfortunately do not enter into the dietary of many Americans. As a matter of comparison, it is shown that oysters, clams, and lobsters contain about two hundred times as much iodine as milk, eggs, or beefsteak." By using such products in the diet several times each week the amount of iodine ingested can be increased considerably, a subject of special interest to persons planning the diet of young people living in districts where disorders of the thyroid gland are common. Oysters are remarkable among ordinary food substances in their high proportion of glycogen, a substance resembling starch, but more readily and easily assimilated, and, unlike starch, wholly digestible even when uncooked.

The United States and many state and municipal governments have awakened to the advisability of supervision and inspection, and there is now exercised a close scrutiny of the sources of oysters that are brought to market or shipped from state to state and of the methods of handling and transporting them. It can be said that oysters today are more sanitary and better than ever, and that there is at least as sufficient a guaranty of their wholesomeness as there is of milk, strawberries, lettuce, celery, and other foods not usually cooked for consumption. If the oyster be cooked, there is a double guaranty.²—(*Issued by U. S. Department of Commerce, Bureau of Fisheries*).

¹ *Oysters: A Little of Their History and How to Cook Them.* By H. F. Moore, U. S. Bureau of Fisheries Economic Circular No. 18, Jan. 23, 1922. Out of print.

² *Oysters: An Important Health Food, With 98 Recipes.* By Lewis Radcliffe, U. S. Bureau of Fisheries Economic Circular No. 58, July 24, 1925. Five cents. (Purchaseable while supply is available from Superintendent of Documents, Government Printing Office, Washington, D. C.)

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New Source of Income for Landowners

"THE part that wild life may play in making lands more productive, and its importance in affording means for their profitable utilization, have in the past had altogether too little attention,

"The lands of the south will bring in millions of dollars, if stocked with game and if the honest hunter can hunt without feeling that he is trespassing;

"Game might prove to be the major source of profit while other forest crops are reaching maturity, and may be made to cover carrying charges during the long period when forest trees are growing to marketable size;

"The hunter could be made to pay the cost of reforestation—in fact he might be a more valuable crop than trees;

"The annual quail crop, if judiciously handled, is worth millions of dollars to the farmers of this country;

"When they start realizing an income from game, farmers will have an added incentive in assisting nature and providing artificial propagation;

"The game birds of the future will come from the farmer who propagates them."

We hear such expressions from many sources, but how can it be done, what practical steps may be taken to promote our wild life possibilities and reap the benefits that can be made to accrue from the successful development of this great enterprise?

Perhaps few, relatively so, realize the stupendous fact that people want to hunt and fish. That the urge of the great outdoors is an irresistible human instinct, impossible of suppression, and that construction of highways and byways with the continued development of automotive transportation, has only begun to permit its full indulgence. More than seven million people bought hunting and fishing licenses last year, and in the face of depression and other adverse conditions, the number has been increasing at the rate of a quarter million annually. These people have paid sums varying from one to a hundred dollars for the privilege of going hunting and fishing, many more have wanted to go but did not for lack of available facilities—and all this, notwithstanding, game is fast decreasing, bag limits growing

smaller and open seasons shorter.

A group of northern states where climatic conditions are not comparable to those in the Southlands, boast an income from tourists lured largely by hunting and fishing facilities, totaling in excess of half a billion dollars annually. Do people want to hunt and fish? The Federal government has already appropriated many millions of dol-

lars for the protection and propagation of wild game, and now a movement is afoot to provide the sum of seven and a half million dollars annually to increase the number of wild game in America, because people want to hunt. Exclusive hunting and fishing clubs are maintained throughout the country to provide sport for the hunter and fisherman. In the state of Texas there are two and a half million acres of land in game preserves, and in Illinois a sportsman's association is forming with an ultimate goal of two million acres in preserves, all because people want to hunt and fish. A foundation with a million dollars has been formed for the sole purpose of increasing game birds in America, because people want to hunt. One must concede, in the face of such evidence, that people not only want field sports, but will have them at whatever cost, but where? "Free public shooting is gone forever in America," says one who reads the handwriting on the wall. It would be fine if the state could give us all good shooting, but can it be done? Private lands are being depleted of game—in thirty states now one has to secure permission to hunt on private lands. Wealthy clubs with limited memberships, have their own private shooting grounds, but the vast majority are wondering where and what they will hunt.

Nature has protected most of her creatures against extinction by providing them with a reproductive capacity that is truly enormous. If there were no natural or artificial checks to multiplication, almost any given species in time would literally cover the earth. A great variety and abundance of wild life was lavished upon our country, but within the memory of some now living, many valuable species have shown an alarming decrease, even to the point of near extinction. Why? It is not what man does, but what he does not do that is responsible for the

By W. L. BROWN



EDITOR'S NOTE

The Louisiana Conservation Department heartily endorses the idea of establishing game farms in Louisiana. No definite plan has yet been proposed officially, and this article is published as the personal plan of Mr. W. L. Brown, of Mandeville, Louisiana.

decreasing numbers. We rely on unprotected wild life to replenish itself, to fight its own battle for life and increase against fire, vermin, and, starvation. Forest fires destroy cover and food, to say nothing of eggs and helpless young. Vermin, the owl, hawk, crow, and the common housecat, with other of his quadruped colleagues, kill and destroy more wild game than all the hunters combined. Who hasn't seen eyes along the highways while driving at night? Cats—hunting birds and finding them, too. Your license only permits you to hunt during the day, it's unlawful to kill wild game at night, but the cat and his associates predators hunt day and night, without license, and they not only take grown-up game, but rob nests of eggs and young. Darwin said, "Add to the checks to increase even slightly, and any species will decrease in numbers. Mitigate the checks to increase even slightly, and the species rapidly will increase in numbers." Since checks permitted by human agencies are responsible for the decrease of wild game, it is obvious that any reversal of the program must be brought about also by man, he must help nature produce; for, with production diminishing and consumption increasing, it is utterly impossible to maintain supply.

"The way to make game more abundant is to commercialize it, private enterprise must be depended upon to protect and propagate wild game." The State can't do it, nor can the individual landowner, but it can be done in the logical way, through cooperation by the landowner, sportsman and the State. What incentive has the farmer or landowner to protect or propagate game on his holdings? Under present conditions he is not justified in going to any trouble or expense to increase wild life, no revenue can possibly accrue to him, so he is not interested. But just let him realize an income from game and see how quickly he will respond to a cooperative plan to increase wild game that his revenues will increase proportionately to his effort to destroy vermin, and provide food and protection on his own property. The hunter is eager for game and ready to pay for the privilege of hunting where it is available, so there surely is a way to compensate the farmer or landowner, for it is there we are to look for more game. "The game birds of the future will come from the farmer who propagates them." Lands are available, millions of acres, but what value is the land to sportsmen without game? It must be restocked and protected and the owner must be justified

in doing the things necessary to maintain an abundant supply of game.

But how can this be done? What practical plan can be evolved by which the sportsman can have hunting and fishing, and the farmer or landowner can realize an income from the use of his lands for the protection and propagation of wild game?

The logical way would seem to be a plan by which some agency representing the sportsmen could contract with the farmer or landowner for the hunting and fishing rights on his property, and pay for the privilege on the basis of game produced and taken on each individual property. The rental value, or hunting and fishing rights on a tract of land producing a thousand quail, and the bag limit of green trout is certainly in excess of that of an equal acreage on which only a hundred quail are produced. The power of land to produce game should be the basis of compensation for its use for hunting and fishing. The price per head for game produced and taken to be paid for the privilege of hunting, and the matter of keeping the records are simple details. The agency would pay the landowner and collect from the sportsman either in the form of annual dues, or daily hunting fees, as are charged by certain private preserves. The agency or club would also provide all necessary facilities and maintain contact with the sportsmen. And will cooperate with the farmer or landowner in working out plans, securing necessary data and in every way assisting him in producing more game.

Such a plan will make field sports available to millions of sportsmen, and at the same time provide a logical way by which the farmer or landowner may realize an income from his lands by developing its wild life possibilities, thereby creating a new source of income for the landowner.

HUNDREDS OF WILD SWANS ARE SWEEPED DOWN NIAGARA

Swept over the famous Horseshoe Falls by swift currents, hundreds of wild swan recently lay dead or dying in the lower Niagara river.

The swans, numbering more than 500, settled on the upper river. As night fell a strong upstream wind diminished and the birds, unable to navigate the treacherous currents, were swept over the cataracts.

Geodetic Surveys in Louisiana

IN THE extension of the Fundamental control surveys of the United States, much work has already been done in the State of Louisiana. This control work consists of arcs of triangulation and lines of leveling and traverse. The triangulation and traverse give geographic positions of stations, lengths of lines between adjacent stations and the azimuths of those lines. The leveling operations furnish elevations of bench marks, based on mean sea level.

The following arcs of triangulation in Louisiana have been completed:

1. An arc of first-order triangulation along the Mississippi River from the northeastern corner of the state to the vicinity of New Orleans;

2. An arc of first-order triangulation from the northwestern corner of the state southward to the vicinity of Mansfield. The arc then swings over into Texas and follows approximately the 94th meridian to the Gulf Coast;

3. An arc of first-order triangulation extending from the vicinity of Mobile Bay along the coast to New Orleans;

4. An arc of first-order triangulation from Donaldsonville, La., southward to the vicinity of Morgan City, thence along the coast to the western boundary of the state;

5. An arc of first-order triangulation extending from the vicinity of Shreveport, eastward to Vicksburg, Miss.

There is one line of traverse in the state which extends from Mansfield along the Texas and Pacific and the Louisiana Railway and Navigation Company railroads to New Roads on the Mississippi River, by way of Naples and Torras.

All of the triangulation and traverse mentioned above has been executed by engineers of the U. S. Coast and Geodetic Survey.

In addition to this first-order triangulation the Coast and Geodetic Survey has done what is called third-order triangulation along the coastal waters of the state. This third-order work is fitted into the first-order triangulation at frequent intervals.

The following lines of levels have been run in the State by the Coast and Geodetic Survey: Shreveport, west to the Texas line near Waskom, Texas.

Shreveport southwest to the Texas line near

By R. S. PATTON

Director, U. S. Coast and Geodetic Survey

Logansport, La.

Shreveport southeastward through Mansfield, Alexandria and Mansura to Naples.

New Orleans westward through Morgan City, New Iberia, Lafayette, Jennings and Lake Charles to the Texas line near Jacksonville, Texas.

The following lines have been run in Louisiana by the Corps of Engineers, U. S. Army:

Shreveport northwest to Oil City.

Shreveport north to Arkansas line near Arkana.

Shreveport east through Monroe to Vicksburg, Miss.

Monroe northwest to Farmerville and north into Arkansas.

Spencer northeast into Arkansas near Wilmot, Ark.

Monroe south through Columbia and Jonesville to Mansura.

Vicksburg, Miss., along the Mississippi River to New Orleans and east to the Mississippi line at mouth of Pearl River.

Jonesville to Natchez, Miss.

Rayville south through Archibald and Gilbert to vicinity of Concordia.

Columbia to Archibald.

Delhi to Crowville.

Gilbert to Newlight.

Shreveport southeastward through Alexandria and Mansura to Smithland.

The Second New Orleans District Engineer office has also run some first-order leveling along the Mississippi and Atchafalaya Rivers in Louisiana within the past two or three years.

The Coast and Geodetic Survey is working on a plan which calls for the extension of arcs of triangulation and lines of levels over the country with a spacing of about 50 miles between the arcs and lines. Already 33,000 miles of arcs of triangulation and approximately 65,000 miles of levels have been extended over the country, largely by the U. S. Coast and Geodetic Survey. Of the latter, some was done by various branches of the Corps of Engineers of the U. S. Army, by the Geological Survey and by several of the railroads.

At the present rate of progress the Federal scheme of 50-mile spacing for triangulation and

leveling will be completed in about 12 years. The states are not required to pay any of the expenses of this work, but any state can secure priority in the completion of the surveys that lie within its area by making a contribution towards the expenses of the work. It is interesting to know that, within the last six months, the Coast and Geodetic Survey and the Highway Commission of North Carolina have entered into an agreement which calls for the completion of fundamental triangulation and leveling of that state within two years. The state agreed to pay part of the expenses of the work.

The use of the data included in the horizontal and vertical control nets of the country is steadily increasing. As land becomes more valuable, owners are more anxious to have boundary lines properly run and perpetuated. Engineering operations are carried on today on a vast scale, involving many millions of dollars for a single project. Under such circumstances, accurate positions, distances, directions and elevations are essential to the efficient planning of the work.

The Coast and Geodetic Survey has recently completed the adjustment of a triangulation net covering the whole country except New York and New England. This adjustment involved many thousand miles of arcs of triangulation, with numerous closed circuits, and it showed that the results have such great accuracy that the derived positions can be held fixed for all time as far as surveying, mapping and other engineering operations are concerned. Of course, a few of the stations will be distributed by earthquake activities. Where a strong earthquake occurs, producing a fault or fissure, a triangulation station close to the fault may be thrown a few feet away from its former latitude and longitude, but such cases are exceedingly rare, and need not be given serious consideration. An earthquake may also disturb any bench mark close to the fault. Should there be evidence of disturbance of triangulation stations and leveling bench marks by an earthquake, reobservations can be made in the field to determine new positions and elevations.

The level nets of the United States and Canada were recently adjusted as a single unit in the office of the Coast and Geodetic Survey. The elevations resulting from that adjustment are being held fixed as standard elevation. In the adjustment mean sea level at each of a number of tidal stations on the Gulf, Atlantic and Pacific coasts was considered to have zero elevation, but in reality it has been found that

the Pacific is slightly higher than the Atlantic, that mean sea level around Florida is several tenths of a foot lower than it is at Galveston, Texas, and that in the New England states it is a large fraction of a foot higher than it is at St. Augustine and Fernandina, Florida. In making the adjustment of the many thousands of miles of lines included in the level net of the country, it was found necessary to hold mean sea level at all of the tidal stations at zero for, otherwise, great confusion would have resulted. The effect of the variation in the elevation of mean sea level at the different tide stations on the elevations in the interior of the country is exceedingly small and, from a surveying and engineering standpoint, it can be considered negligible.

As rapidly as practicable, triangulation and leveling data are printed in pamphlet form in order that the results of the work of the survey may be available in the best form for the use of engineers of the Federal government, states, cities and counties and for the use of private corporations. Pending the publication of such data, engineers can obtain copies of the results in manuscript form on application to the Director of the U. S. Coast and Geodetic Survey, Washington, D. C. A small charge is made to cover the cost of photostating the original sheets.

Editorials

(Continued from Page 1)

Forest Service planted 8,452 acres and the State 26,617 acres.

Forest planting in New York by various state, municipal and private agencies reached 24,250 acres. Pennsylvania planted 18,048 acres to public and private forest.

Planting in Delaware, Maryland, and New Jersey aggregated 1,672 acres. New England reports show a total 11,614 acres planted. The South Atlantic States planted 5,556 acres, Georgia leading with 2,542. Gulf States set out 7,869 acres, Louisiana's share being 6,556.

In Ohio, private and public agencies planted 2,633 acres, largely farm woodlands. Beginnings were made in several Central States with reforestation used especially as a check to erosion of farm lands. Part of Wisconsin's planting of 6,086 acres were for watershed and farm protection as well as for the production of timber crops.

Nebraska was notable for the number of participants in its planting program. The Forest Service and 3,021 Nebraska farmers and other agencies accounted for 2,603 acres planted, much of it for windbreaks and shelter belts.

In the West, 1,305 acres were planted in Montana, 4,270 in Idaho, 1,669 in Colorado, 1,079 in California, 1,314 in Oregon, and 4,065 acres in Washington.

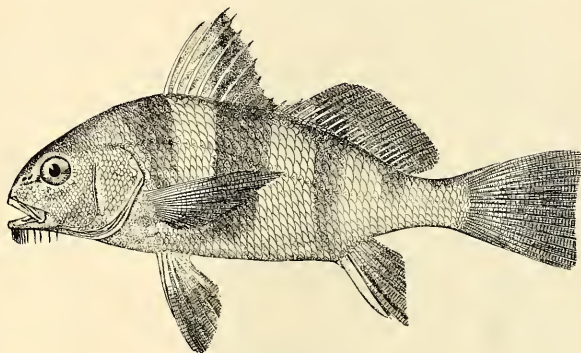
Plantings by industrial organizations included 3,943 acres by paper and pulp mills; 11,373 by lumber companies; 3,525 by mining companies; 934 by railroad companies; 8,307 by water power companies; and 2,148 by other companies; a total of 30,230 acres reforested by industries.

The Black Drum

(*Pogonias Chromis*)

OF considerable interest among the food fishes of our Atlantic and Gulf coasts is the black drum, *Pogonias chromis*, occurring with varying abundance in the different localities along its range from Massachusetts to the mouth of the Rio Grande. This fish often reaches a weight of about 20 pounds, while individuals weighing over 50 pounds are not rare. The largest black drum caught, of which there is record, weighed 146 pounds. The adult is dusky and occasionally has considerable bronze or silver on the head and along the sides. After death the fish becomes much darker and in general appearance is uniformly black. Until the young are about a foot in length, they are silvery gray and have 4 or 5 distinct black vertical bars along sides which become obscure in later life.

As a food fish the black drum is not esteemed, as its flesh is apt to be coarse and unpalatable. However, it is frequently cut into steaks and sold at a low price in many localities along our coast. Its low value precludes its shipment far from the sea coast, although the smaller fish are considered by many quite equal, or, even superior to the redfish (*Sciaenops ocellatus*) or the spotted sea trout (*Cynoscion nebulosus*).



THE DRUM
(*Pogonias chromis*)

One of the largest and most interesting of the Croakers, the Sea Drum, ranges from Massachusetts to the Rio Grande and as far south as the coast of Argentina. It may reach a size of four feet and a weight of one hundred and forty-six pounds, and is remarkable both for its powers of sound production and its ability to feed upon oysters and other shell fish. Schools of Drum are capable of doing great damage to oyster beds and shell fish seem to be their chief food. Along the inner edge of the lower side of the jaw it bears a number of conspicuous barbels.

Texas leads all other States in the production of black drum, yielding about 67 per cent of the volume in 1929. The foregoing table shows the commercial distribution of black drum in 1929.

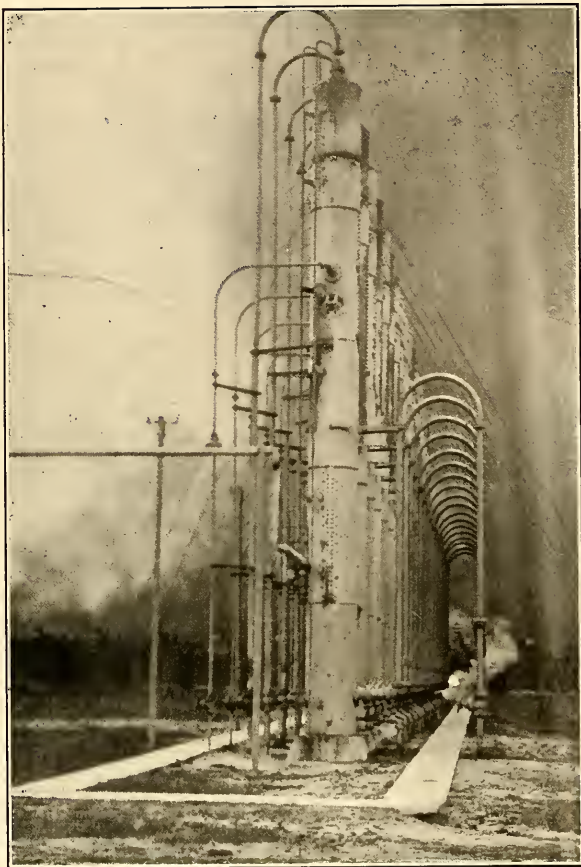
The drum is a bottom feeder, and grubs around on the bottom in search of shellfish and other marine invertebrates, on which it feeds. It is provided with broad pavement-like teeth and very

powerful jaws, which can easily crush all but the most heavily armored shellfish. It is said that the drum is sometimes very voracious, and that a school will pass over a shell fish bed crushing and devouring large numbers of oysters and other molluscs. Despite these facts, however, the drum is seldom common in regions where it is supposed to do such damage, and it is probable that such reports are much exaggerated.

A small mollusc (*Mulinia transversa corbuloides*), found in deep mud, constitutes the principal food of the fish and the stomachs of young as well as adult drum are usually filled with the crushed shells of this clam. This is interesting in that it helps to explain the preference of both young and old fish for the extremely shallow and muddy bays along the Texas coast where the species abounds at all times of the year. In Florida the drum spawns in March, but in the vicinity of Virginia and Maryland spawning does not occur until the end of April or in May, at which time the first catch of drum is made in the pound nets. The drum, as determined by a recent investigation along the coast of Texas, spawn principally in the early spring from February to May, although spawning fish in small numbers may be found as late as September and October. A dis-

States	Pounds	Value
Texas	951,277	\$32,931
Louisiana	266,367	15,565
Florida	83,489	2,380
Maryland	32,000	480
New Jersey	25,500	474
Alabama	29,723	1,201
Virginia	19,350	763
Mississippi	13,757	774
North Carolina	800	40
Delaware	600	14
South Carolina	437	35
Total	1,417,000	\$54,657

(Continued on page 37)



A battery of absorbers in the Monroe Field. Here the natural gas is forced through the containers, which are filled with mineral seal oil, and the high grade gasoline extracted before the gas is burned for carbon black purposes.

BANDINI PETROLEUM COMPANY et al. v. The Superior Court of the State of California, in and for the County of Los Angeles et al. Supreme Court of the United States. No. 43. On appeal from the California District Court of Appeals, Second Appellate District. Robert B. Murphy (Asa V. Call with him on brief), for appellants; James S. Bennett, Attorney for Director of Natural Resources (U. S. Webb, Attorney General of California, with him on brief), for appellees.

OPINION OF THE COURT NOV. 3, 1931

Chief Justice Hughes delivered the opinion of the court.

The appellants are producers of oil and gas from their respective wells in the Santa Fe Springs oil

Natural Gas Conservation Statute Is Held Invalid

fields in Los Angeles County, Calif. In September 1929, the State, acting through its Director of Natural Resources, brought suit in the Superior Court of the State against the appellants and others, seeking to enjoin an alleged unreasonable waste of natural gas in that field.

The authority for the suit was found in Section 8b and 14b of what is called the Oil and Gas Conservation Act of California. Stats. Cal. 1915, ch. 718, 1917, ch. 759; 1919, ch. 536; 1921, ch. 912; 1929, ch. 535. Section 8b prohibits "the unreasonable waste of natural gas" and Section 14b authorizes suit by the Director of Natural Resources to enforce the prohibition. (Note No. 1)

The superior court granted a preliminary injunction after a hearing upon the pleadings, affidavits, oral testimony and documents submitted. The court recited in its order that there appeared to be an unreasonable waste of natural gas in the Santa Fe Springs oil field, and that an injunction was necessary in order "to preserve the subject matter of the action to abide the decree of the court at the conclusion of the trial." The court restricted the average daily production of "net formation gas" from "any lease or other property unit" to the amount shown for each operator in an accompanying schedule (Note No. 2)

The court also directed each defendant to file reports showing the daily production of gas and oil, and the order was without prejudice to the right of any of the parties to move on five days' notice for modification of the injunction. The court later modified the order in particulars not important here. Appellants state that the order curtailed their production of gas from 57,120,000 to 27,187,000 cubic feet a day.

APPELLANTS' CONTENTIONS REGARDING TERM WASTE

Thereupon the appellants sought a writ of prohibition from the District Court of Appeal, Second Appellate District of the State, restraining the Superior Court and the respondent, William Hazlett, as one of its judges, from enforcing the injunction order. The jurisdiction of the Superior Court was attacked upon the ground of the invalidity of the statute invoked.

The appellants contended, in substance, that the

Conservation Act Sustained by Supreme Court

Be Sufficiently Certain in Prohibiting "Unnecessary Waste" of Natural Resources

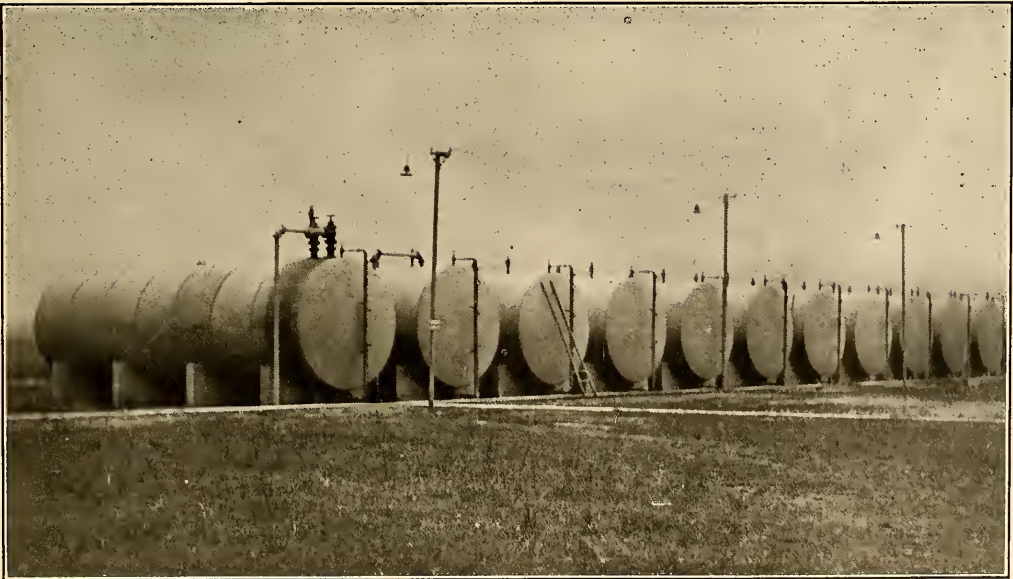
statute violated the due process clause of the Fourteenth Amendment in that it afforded no certain or definite standard as to what constituted "waste" or "unreasonable waste" and unlawfully delegated power to the Superior Court to legislate upon that subject; in that, upon the facts and as applied against the appellants, the statute prohibited them "from utilizing such amount of natural gas produced from their respective wells" as was "reasonably necessary to produce oil therefrom in quantities not exceeding a reasonable proportion to the amount of oil produced from the same well;" and in that the statute required appellants to curtail their production of oil and gas "for the purpose of conserving such natural gas for the benefit of the general public" without eminent domain proceedings and without just compensation, and was so arbitrary and oppressive that it was in excess of the power of the State.

By reference to their pleadings in the injunction

suit, the appellants also assailed, under the due process clause, the provision of the statute as to what should constitute prima facie evidence of unreasonable waste, and the appellants further insisted that the statute as enforced against them impaired the obligation of their lease contracts in violation of the contract clause of the Federal Constitution and that they were denied the equal protection of the laws as guaranteed by the Fourteenth Amendment.

PROCEEDING FOR WRIT OF PROHIBITION DISCUSSED

The respondents (appellees here) demurred to the petition, and the district court of appeal, entertaining and overruling the contentions of the appellants under the due process clause denied the writ of prohibition. 63 Calif. App. Dec. 1175, 293 Pac. 899. The appellants then applied for a hearing in the supreme court of the State and, this having been denied, they seek in this court a review of the judgment of the district court of appeal.



Battery of mineral seal oil containers used in the recovery of gasoline from natural gas in the Monroe Gas Field.

This court has jurisdiction. The proceeding for a writ of prohibition is a distinct suit, and the judgment finally disposing of it is a final judgment within the meaning of section 237 (a) of the Judicial Code. U. S. C., tit. 28, sec. 344. *Weston v. Charleston*, 2 Pet. 449, 464; *Mt. Vernon Cotton Co. v. Alabama Power Co.*, 240 U. S. 30, 31; *State of Missouri ex rel. St. Louis B. & M. Rwy. Co. v. Taylor*, 266 U. S. 200, 206; *Michigan Central R. R. Co. v. Mix*, 278 U. S. 492, 494.

That judgment, however, merely dealt with the jurisdiction of the superior court of the suit for injunction, and the only question before us is whether the district court of appeal erred in deciding the Federal questions as to the validity of the statute upon which that jurisdiction was based. Moreover, with all questions of fact, or with questions of law, which would appropriately be raised upon the facts adduced in the trial of the case in the superior court, as a court competent to entertain the suit, we are not concerned on this appeal.

The appellants annexed to their petition in the prohibition proceeding, and made a part of it, the pleadings in the injunction suit and the affidavits presented upon the hearing of the application for preliminary injunction. But they could not in that manner, or by their characterization of the evidence thus adduced, or by pleading the conclusions derived therefrom, substitute the district court of appeal for the superior court in the determination of the facts, or of the law as addressed to the facts, which should properly be considered by the latter tribunal.

PROVINCE OF WRIT IN STATE CONSIDERED

It appears that in California, in accordance with the general conception of the province of the writ, prohibition is for the purpose of arresting the proceedings of any tribunal exercising judicial functions when such proceedings are without, or in excess of, jurisdiction. *Calif. Code of Civ. Pro.*, secs. 1102, 1103; *Jacobsen v. Superior Court*, 192 Cal. 319; 219 Pac. 986. See, also. *Baar v. Smith*, 201 Calif. 87, 101; 255 Pac. 827, 833. The writ of prohibition is not available as a substitute for an appeal from a court having jurisdiction.

As was said by the Supreme Court of California, in *Truck Owners & Shippers, Inc., v. Superior Court*, 194 Calif. 146, 155; 228 Pac. 19, 22, 23: "If the superior court has jurisdiction to entertain the action, it has the power to define the right sought to be protected. * * * If the judgment of the superior court be incorrect, it may be reversed on appeal, but not on prohibition."

After the decision of the district court of appeal, and before the denial by the supreme court of the State of a hearing in the instant case, the latter court passed upon the constitutional validity of the statute in question. That decision was made upon an application for a writ of supersedeas pending on appeal by certain codefendants of the appellants here (who were not parties to the appeal) from the above-mentioned injunction order. *People ex rel. Stevenot, Director of Natural Resources, v. Associated Oil Co. et al.*, 80 Calif. Dec. 607; 294 Pac. 717.

The supreme court found no reason to interfere with the action of the superior court, on that appeal, affirmed the injunction order holding that under the statute the superior court had the power to determine what wastage of gas in the production of oil was unreasonable. *Id.* 81 Calif. Dec. 468, 471; 297 Pac. 536, 537. The district court of appeal in the instant case had expressed the same opinion and accordingly decided that it could not interfere by writ of prohibition. 63 Calif. App. Dec. at p. 1186; 293 Pac. at p. 907.

VALIDITY OF THE STATUTE AND JURISDICTION QUESTIONED

It follows that, in considering and deciding Federal questions in the prohibition proceeding, the district court of appeal must be regarded, as its opinion imports, as having determined merely that the statute was valid upon its face, so that the Superior Court had jurisdiction to entertain the injunction suit. It is that determination alone that we can now consider.

The district court of appeal overruled the contention that the statute was so uncertain and devoid of any definition of a standard of conduct as to be inconsistent with due process. The supreme court of the State, reaching the same conclusion (in the opinion above cited, 80 Cal. Dec. at pp. 614, 615; 294 Pac. at p. 724) described the general condition in which oil and gas were found in California and the standard which the court considered to be established by the statute. After observing that courts were entitled to take judicial notice of the condition and development of the petroleum industry, and of matters of science and common knowledge, and referring to scientific reports, the Supreme Court said:

"For present purposes it need only be noted that oil in this State is found under layers of rock in a sand or sandstone formation termed a lentille or 'lentil,' under pressure caused by the presence of natural gas within the formation. The layers of rock thus form a gas-tight dome or cover for the oil reserve. The oil adheres in the interstices

between the sand particles. The natural gas may be in a free state at the top of the dome, but is also in solution with the oil, thus increasing the fluidity of the oil and the ease with which the oil is lifted with the gas in solution when the pressure on the gas is released by drilling into the oil 'sand.'

"It is estimated that only from 10 to 25 per cent of the total amount of oil deposited in a reservoir is ultimately recovered, depending on the natural characteristics of the reservoir and the methods employed in utilizing the lifting power of the gas. The importance of gas in the oil-producing industry has, therefore, become a question of great concern to the industry itself and to Government, to the end that its function may be fully utilized without waste.

FACTORS AFFECTING OUTPUT COMPUTATION

"It fairly appears on this application that, depending on its location in the oil reservoir, the extent of the oil 'sand,' the degree of pressure within the formation, the amount of oil in the 'sand,' the amount of gas in solution with the oil, the porosity of the 'sand' and other considerations, each oil and gas well has a best mean gas and oil ratio in the utilization of the lifting power of the gas and the production of the greatest quantity of oil in proportion to the amount of gas so utilized, and which may be computed as to each individual well to a reasonable degree of certainty, and be regulated accordingly."

In view of these circumstances, the Supreme Court concluded that it might be said that there was an "unreasonable waste" of gas where it "has been allowed to come to the surface without its lifting power having been utilized to produce the greatest quantity of oil in proportion." It was such a waste of gas, the court said, that the Legislature of California intended to prohibit. In support of this conclusion the court referred to the provisions of section 8d of the statute. (Note No. 3) These provisions showed, in the opinion of the court, that the Legislature had "plainly adopted the standard so expressed," that is, "that gas may not be produced, under existing conditions where the production thereof so greatly exceeds the market demand therefor, in quantities exceeding a reasonable proportion to the amount of oil produced."

PROPORTION OF GAS TO OIL PRODUCED

And, in explanation of its reasons for considering such a standard sufficiently definite, the court said that "because of the many and varying conditions peculiar to each reservoir and to each

well, which will bear upon a determination of what is a reasonable proportion of gas to the amount of oil produced, it may be said that it would be impossible for the Legislature to frame a measure based on ratios or percentages or definite proportions which would operate without discrimination, and that what is a reasonable proportion of gas to the amount of oil produced from each well or reservoir is a matter which may be ascertained to a fair degree of certainty in each individual case."

The statute is to be read with the construction placed upon it by the State court. *Lindsley v. Natural Carbonic Gas Co.*, 220 U. S. 61, 73. And, so read, we find no ground for concluding that the statute should be regarded as invalid upon its face, merely by reason of uncertainty, so as to deprive the superior court of jurisdiction to consider the relevant questions of fact and to determine with respect to a particular field whether or not there has been the unreasonable waste of gas which the statute condemns. *Nash v. United States*, 229 U. S. 373, 377; *Miller v. Strahl*, 239 U. S. 426, 434; *Omaechevarria v. Idaho*, 246 U. S. 343, 348; *Hygrade Provision Co. v. Sherman*, 266, U. S. 497, 502.

APPELLANTS' FURTHER CONTENTION ON INVALIDITY

The appellants make the further contention that the statute is invalid because of the provision of section 8b (*supra*, p.—) that "the blowing, release or escape of natural gas into the air shall be prima facie evidence of unreasonable waste." The State, in the exercise of its general power to prescribe rules of evidence, may provide that proof of a particular fact, or of several facts, or of several facts taken collectively, shall be prima facie evidence of another fact when there is some rational connection between the fact proved and the ultimate fact presumed.

The legislative presumption is invalid when it is entirely arbitrary, or creates an invidious discrimination, or operates to deprive a party of a reasonable opportunity to present the pertinent facts in his defense. *Mobile, etc., Railroad Company, v. Turnipseed*, 219 U. S. 35, 43; *Bailey v. Alabama*, 219 U. S. 218, 238; *Lindsley v. Natural Carbonic Gas Company, supra*, at pp. 81, 82; *Manley v. Georgia*, 279 U. S. 1, 5, 6; *Western & Atlantic v. Henderson*, 279 U. S. 639, 642. In the present case there is a manifest connection between the fact proved and the fact presumed, and under the construction placed upon the statute by the State court there appears to be no depriva-

tion of a full opportunity to present all the facts relating to operations within the field.

The question remains whether the statutory scheme of regulation, with the standard which it sets up under the construction of the State court, is on its face beyond the power of the State. The district court of appeal, in the instant case, approached this question by considering the correlative rights, under the law of California, of surface owners in the same field.

TITLE ON GAS AND OIL AND THEIR POSSESSION

The court concluded that under the law of California "on account of the self propelling or migratory character of natural gas, as well as oil," the owner of the surface did not have an absolute title to the gas and oil beneath, and could acquire such a title only when he had reduced these substances to possession. As justifying this opinion, the court cited the case of *Acme Oil Company v. Williams* (140 Calif. 681; 74 Pac. 296) where the Supreme Court of the State had said, with respect to oil, that it is "of a fluctuating, uncertain, fugitive nature, lies at unknown depths, and the quantity, extent and trend of its flow are uncertain.

"It requires but a small surface area, in what is known as an oil district, upon which to commence operations for its discovery. But when a well is developed the oil may be tributary to it for a long distance through the strata which hold it. This flow is not inexhaustible, no certain control over it can be exercised, and its actual possession can only be obtained, as against others in the same field, engaged in the same enterprise, by diligent and continuous pumping.

"It is the property of anybody who can acquire the surface right to bore for it, and when the flow is penetrated, he who operates his well most diligently obtains the greatest benefit, and this advantage is increased in proportion as his neighbor similarly situated neglects his opportunity." And the Supreme Court of the State, in its decision dealing with the statute in question, quoted this language and held that "the same rule would apply to natural gas." 80 Calif. at p. 612; 294 Pac. at p. 722.

REGULATORY POWERS OF STATE DISCUSSED

It was with that understanding of the law of the State that the district court of appeal considered the statute, taken as a whole, as one regulating and adjusting the coexisting rights of the surface owners in the same field, and accordingly sustained the statute as a valid exercise of State

power against the contentions under the due-process clause. The court said: "It is the coexistence of these rights which authorizes the State to make use of its legislative power. When the rights of one impinge upon the rights of others, the State may interpose for the purpose of adjusting and regulating the enjoyment of those rights."

The district court of appeal apparently thought it doubtful whether the State might restrict or regulate the production of oil or gas "on the theory of the public's interest in their natural resources," but deemed it unnecessary to decide that question in the present case. That court explicitly refused to accept the view that the statute "does not proceed upon the theory of correlative rights, but only upon the policy of conserving or preserving the common supply."

And, replying to the suggestion that the Legislature was without authority to restrict the production of oil, the District Court of Appeal concluded its opinion with the statement that the record did not "indicate that the temporary injunction was founded upon such a theory. Nor are we determining that the act attempts to confer upon the court any such power. Rather we are convinced that a proper construction of the enactment confines the authority within the limits of enjoining the production of gas when in excess of the reasonable proportion to the oil for the particular field involved, when not conveniently necessary for other than lifting purposes."

While this was the basis of the decision of the District Court of Appeal, the appellants insist that, in the subsequent decisions upon the appeal from the injunction order of the Superior Court, the Supreme Court of the State has taken a broader ground and has upheld the statute as one designed to protect the public interest in the conservation of natural resources. 80 Cal. at pp. 612-614; 294 Pac. at pp. 722, 723. We do not understand, however, that the Supreme Court in taking that view denied the operation of the statute as a safeguard of the coexisting rights of surface owners.

RIGHT TO DETERMINE WASTING IN PRODUCTION

On the contrary, the supreme court, in its second decision affirming the injunction order of the superior court, summed up its conclusion in these words (81 Calif. at p. 471; 297 Pac. at pp. 537, 538): "We reiterate that the legislation in question has lawfully vested in the superior court the power to determine what wastage of gas in the production of oil is reasonable or unreasonable. Whether such wastage be reasonable or unreason-

able is a question of fact and should be determined in view of the necessity of one land owner to make productive use of his parcel, in view of the equal right of the adjoining owners not to be deprived of correlative production from their parcels and in view of the right of the public to prevent the waste of that which cannot be replaced."

If the statute be viewed as one regulating the exercise of the correlative rights of surface owners with respect to a common source of supply of oil and gas, the conclusion that the statute is valid upon its face, that is, considered apart from any attempted application of it in administration which might violate constitutional right, is fully supported by the decisions of this court. *Ohio Oil Co. v. Indiana*, 177 U. S. 190, 210, 211; *Lindsley v. Natural Carbonic Gas Co.*, supra, at p. 77; *Walls v. Midland Carbon Co.*, 254 U. S. 300, 323.

In that aspect, the statute unquestionably has a valid operation, and it cannot be said that the superior court was without jurisdiction to entertain the suit in which the injunction order was granted. That was all that the District Court of Appeals determined in the judgment now under review. It is not necessary to go further and to deal with contentions not suitably raised by the record before us. Constitutional questions are not to be dealt with abstractly. Having jurisdiction of the suit the Superior Court has authority to take steps to protect the subject matter of the action pending the trial on the merits.

The injunction order stated that to be its purpose. Upon the trial, all questions of fact and of law relevant to the application and enforcement of the statute may be raised and every constitutional right which these appellants may have in any aspect of the case as finally developed may be appropriately asserted and determined in due course of procedure.

Judgment affirmed.

1.—These sections are as follows:

Sec. 8b. The unreasonable waste of natural gas by the act, omission, sufferance or insistence of the lessor, lessee or operator of any land containing oil or gas, or both, whether before or after the removal of gasoline from such natural gas, is hereby declared to be opposed to the public interest and is hereby prohibited and declared to be unlawful. The blowing, release or escape of natural gas into the air shall be prima facie evidence of unreasonable waste. (Stats. Cal. 1929, ch. 535, p. 927.)

Sec. 14b. Whenever it appears to the director of the department of natural resources that the owners, lessors, lessees, or operators of any well or wells producing oil and gas or oil or gas are causing or permitting an unreasonable waste of gas, he may institute, or have proceedings instituted, in the name of the people of the State of California,

to enjoin such unreasonable waste of gas regardless of whether proceedings have or have not been instituted under section 8 hereof, and regardless of whether an order has or has not been made therein. Such proceedings shall be instituted in the Superior Court for the county in which the well or wells from which the unreasonable waste of gas is occurring or any thereof are situated. The owners, lessors, lessees or operators causing or permitting an unreasonable waste of gas in the same oil or gas field, although their properties and interests may be separately owned and their unreasonable waste separate and distinct, may be made parties to said action. In such suits no restraining order shall be issued ex parte, but otherwise the procedure shall be governed by the provisions of chapter 3, title 7, part 2 of the Code of Civil Procedure of the State of California and no temporary or permanent injunction issued in such proceedings shall be refused or dissolved or stayed pending appeal upon the giving of any bond or undertaking, or otherwise. (Stats. Cal. 1929, ch. 535, p. 930.)

2.—The injunction order sets forth "that the evidence available to the court at this time shows that the unreasonable waste of natural gas in said field may be substantially reduced and that the equities of all parties may be fairly conserved by a preliminary injunction which will limit the waste of gas by restricting the production thereof to a quantity reasonably in excess of the present outlets for beneficial use above ground, require the extraction of gasoline from the gas produced in the field; that accordingly for the purposes of this order, the total gas outlets for all uses with a reasonable tolerance to take care of fluctuating demands and the necessary waste is taken at approximately 285,000,000 cubic feet of gas each day, and the estimated potential production of oil is taken at 237,576 barrels each day distributed among leases and other operating property units, as shown in the schedule hereafter set out; and that sufficient cause has been shown for the extraordinary relief of a preliminary injunction pending the trial of the action on the merits, and the entry of a final judgment herein,

"It is ordered and decreed that the above named defendants * * * be and they hereby are restrained and enjoined * * * until the further order of this court as follows:

"1. From blowing, releasing or permitting any natural gas to escape into the air from any well or wells in the Santa Fe Springs Oil Field before the removal of the gasoline from such natural gas.

"2. From operating any well producing natural gas in the Santa Fe Springs Oil Field except while exercising a high degree of care in the selection and adjustment of appliances and in the use thereof for the purpose of keeping each producing well in its 'optimum gas-oil ratio'—the term 'optimum gas-oil ratio' being defined as the smallest number of cubic feet of gas which can be produced with each barrel of oil from the same well at the same time.

"3. From producing more net formation gas on the average day of each seven-day period from any lease or other property unit than is set forth in the 'Allowed Gas Production' column" than that shown for each operator in the accompanying schedule.

3. Section 8d relates to the procedure upon complaint of undue waste, and the portion quoted by the Supreme Court of the State is as follows: "If it shall appear that gas is being produced from any oil well or wells in quantities exceeding a reasonable proportion to the amount of oil produced from the same well or wells, even though it is shown that such excess gas is being used in the generation of light, heat, power or other industrial purpose and that there is sufficient other gas available for such uses from other wells in the same or other fields in which the gas produced is not in excess of the amount which bears a reasonable proportion to the amount of oil produced from such other wells and that there are adequate gas pipe line connections between such other wells and the place of utilization of such gas the State oil and gas supervisor shall hold that such excess production of gas is unreasonable waste thereof if such holding will not cause an unreasonable waste of gas in any other field."

Louisiana Nature Guardians

"Upon my honor, as a Louisiana Nature Guardian, I promise to take care of all our natural friends, to guard and protect them to the best of my ability, and as far as possible influence others to do the same."

ESTELLE VERJIE COTTMAN, *Editor*

WHEN the Nature Guardian Club of Louisiana was formed several years ago, it met an instant and hearty response from the teachers and the school children all over the State. From a small interested group it has grown steadily into a mighty force of thousands of young conservationists. These children are the proud possessors of handsome lithographed badges, and certificates of membership. New Clubs are being formed each week and it is the purpose of the Educational Bureau to enroll every Louisiana boy and girl, white or colored, under the Nature Guardian banner.

HOW YOU CAN BECOME A NATURE GUARDIAN

YOUR PART

Consult your teacher.

Ask that the purpose and plans of the Nature Guardian Club be explained to you and the class. Ask for an application card.

Get a responsible person to indorse it, after proving that you fully understand the duties of a Nature Guardian.

Sign the application and mail the card post-paid, or give to your teacher, to send with cards from all the class.

OUR PART

We send the application card.

We send you a handsome badge, a certificate of membership, Nature Guardian pamphlets and other literature.

This is all free, and is carried on with the purpose of instilling in the children's minds a knowledge of Louisiana's wild life and a thorough understanding of its economic value to the State.

It also aims to develop individual humanitarianism. Even within this short time an amazing improvement has been made in the mental attitude of our young folks toward the conservation and protection of Louisiana's natural resources.

EDITORIAL

MY DEAR GUARDIANS:

Nature, like an orderly housewife, has divided her creatures into groups, each, apparently, with its own work to do. Her plan is quite easily seen when we come to study the birds, for some of our feathered friends have certain special duties to perform and others have those just as important, but noticeably different.

The nighthawk or "bull bat" as he is often called in Louisiana, is a policeman of the dusk. To him is entrusted the work of clearing the air of such flying insects as gnats, mosquitoes, moths, and boll weevils. He flies slowly, and sweeps low, holding his large mouth open and gathering in the insects on the wing.

The work he does is invaluable, for he destroys certain moths which produce various harmful worms and caterpillars.

The swifts, or chimney sweeps, are also workers in clearing the air. They never light except when they return at night, and they take hundreds of winged insects as they fly.

Phoebes and pewees dart from their perches whenever their bright eyes detect flying insects.

The "bee martin" or "kingbird" eats few bees, but is a dreaded enemy of the "robber fly," who kills and robs bees of their honey. Thousands of these kingbirds have been killed by farmers who thought them enemies of the bees.

The busy little warblers, vireos, and nuthatches take care of the small twigs, buds, and young leaves, eating the tiny insects (and their eggs) that infest these parts of the trees and shrubs.

Mocking birds, orioles, cardinals, thrushes, wrens, and rain crows protect the larger leaves from bugs, caterpillars, beetles, and leaf eaters.

To the woodpecker, sapsucker, and flicker belong the duty of caring for the limbs, trunk, and bark of the trees, in order to check the inroads of worms and beetles that would cause the trees to decay in a few years. One woodpecker can destroy hundreds of insects in a day.

Flickers and thrashers are valuable ground policing birds, as are also the quail, field larks, and robins. Some of these eat insects mainly, and some eat weed seeds, but some have about a fifty-fifty appetite for seeds and insects.

An important aim of the Nature Guardian Club is the protection of birds. Much has been done already by spreading information about their economic importance, but there are still people who do not realize the absolute necessity for birds, nor their purpose in the great natural world. When farmers and others realize that crops are dependent upon the ability of the birds to keep insects and weeds in subjection, there will be a tremendous increase in the number of birds and in crop value, and a corresponding decrease in insects and worms which destroy vegetation.

Again we urge the Guardians to be zealous in helping conserve the beautiful Louisiana birds during the spring and summer.

With love and best wishes for all the Guardians.

Very cordially yours,
THE EDITOR.

The above was suggested by a chapter in "Elements of Conservation," by Gerrard Harris.

Castor, La.,
Jan. 7, 1932

DEAR EDITOR:

I submit the following poem, hoping that I shall see it in the Nature Guardian page:

THE OTTER

I saw a little otter
Sitting on the river's bank;
He saw the trail of a salmon flip
And into the water he sank.

The salmon fish was very quick
But the otter small was quicker,
When the otter was through with him,
The salmon was the sicker.

He didn't try to show his prank
But dragged his prey upon the bank.
I watched the beast until he fled,
Leaving a trail where the salmon bled.

Yours truly,

MINNIE M. MCINNIS.

We think this is quite a nice little poem, Minnie. Why did you not let the otter catch a Louisiana fish, though?

Lockport, La.
Feb. 2, 1932.

Nature Guardian Editor,
New Court House Bldg.,
New Orleans, La.

DEAR EDITOR:

I have been reading the Louisiana Conservation Review nearly every month. I have read books about wild life in Louisiana and I think I understand all the duties of a member. I also think I will be able to carry them all out.

There has been reached a point where nearly all our natural resources have disappeared and by having a Louisiana Nature Guardian Club, it helps to save our nature resources for future generations.

Therefore if you will send us an application card, I will fill same out as soon as possible and work hard to make a strong upholding Club.

Yours very truly,

ETHEL DUFFY.

St. Louis, Mo.
4108 Comellia St.,
Jan. 22, 1932

DEAR EDITOR:

I often go over to a park near by home, and there I find strange tracks of birds and small animals. The park is a bird sanctuary. If you

have any books on tracks, will you please send me copies. Last week I won a contest for the best composition on a state. I had Louisiana, and I won the prize.

I am an honorary Nature Guardian.

Yours truly,
JOSEPH LEOPY.

BIRD TRADES

By Evelyn Denton
(A true bird lover)

The swallow is a mason, and underneath the eaves
He builds a nest and plasters it with mud, and
hay, and leaves.

Of all the weavers that I know, the oriole is the
best;

High on the branches of the tree she hangs her
cosy nest.

The woodpecker is hard at work, a carpenter
is he;

And you may hear him hammering his nest up
in a tree.

Some little birds are miners, some build upon the
ground;

And busy little tailors, too, among the birds are
found.

Amite, La.
Jan. 13, 1932

DEAR EDITOR:

I am writing to tell you how much I liked
your talk over at the school Wednesday.

I am a Nature Guardian and like the Club
very much.

I have learned a great deal lately about the
natural resources of Louisiana. I have learned
about the skunk, and about the people taking
muskrat skins and selling them for mole skins.

Enclosed is a box that had aspirin in it. But
now it has a sort of bead in it. Some people say
it is a pearl, so I thought I would send it to you.
I found it in a Louisiana oyster.

Yours very truly,

RACHEL ANN PERCELL.

Thank you, Rachel Ann. The little pearl
reached me safely, and I was very much interested
to read your account of it. Perhaps some day
you will send me a little story about the
oyster.

Here is a list of names of new members of
Nature Guardian Club. They are very welcome.
We know they will be worthy members.

Byron Busick,	Newllano, La.
Iris Busick,	Newllano, La.
Lenine Tabb,	Newllano, La.
Eugene Swenson,	Newllano, La.
Ione Quipp,	Newllano, La.
Genevive Quipp,	Newllano, La.
Ofille Ogden,	Newllano, La.
Ernest Ogden,	Newllano, La.
Mildred Campbell,	Newllano, La.
Irene Wilkerson,	Newllano, La.
Wm. E. Mittelbushcher,	Newllano, La.
Ruth Wooley,	Newllano, La.

Ross Woolley,
Ruth Jernberg,
Eugene Hewett,
Bonnie Hewett,
Frances Roe,
Lucille Roe,
Raymond Campbell,
Wanda Self,
Frances Wilkerson,

Newllano, La.
Newllano, La.
Newllano, La.
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Newllano, La.
Newllano, La.

We shall be glad to hear from our members at any time, and shall be glad to print their

poems, themes, and letters about any of the natural resources of Louisiana. We hope that our next issue will contain many interesting articles by members of our Club.

Address all letters to: NATURE GUARDIAN EDITOR, DEPARTMENT OF CONSERVATION, New Court Building, New Orleans, La.

A Laughable Deer Hunt

By E. B. COPE

Many are the yarns that have been told of deer hunting experiences, but one of the most laughable ones to occur was told by a veteran game warden upon a recent visit to New Orleans.

With a younger member of the force, the Old Timer was visiting a certain large estate in the vicinity of Pass Manchac, when some one called attention to the fact that the camp was running out of fresh meat.

The deer season was open, and the suggestion was made that the Old Timer and his Junior go out and get a buck to replenish the larder.

The weather was warm and muggy and a storm was brewing. Dark threatening clouds were driving before a gusty wind of almost gale-like intensity, and a depressing gloom enshrouded the surrounding country.

The afternoon was drawing toward evening when the hunters started out in their tiny pirogue, and the Old Timer told Junior to take his head light so that they could find their way out of the swamp after darkness fell.

Deer were plentiful and several times Junior's gun jerked to his shoulder only to be checked by the Old Timer's warning that the bucks were too large, as they had no desire to kill a big buck on account of the heat and the lack of ice at the camp.

Finally, the sharp crack of the smokeless powder awoke the echoes of the gloomy swamp, and Old Timer heard the thrashing of a dying deer among the palmetto scrub not far from the bank. With a deft stroke of the paddle he swung the tiny craft over to the bank and the hunters scrambled ashore and hastened over to their quarry, a fat and young spike horn buck of just the right size for the camp larder.

Darkness was so close at hand that the

hunters did not want to dress their kill, but hastily tumbling the buck into the boat, started back for the camp which was some distance away.

Old Timer told Junior to light his head light in order to find their way in the gathering gloom down the sinuous water way of the drainage canal, and that was the cause of the laughable finale of the hunt.

Even with the light the hunters became confused and paddled into the back yard of the Camp which was surrounded by a poultry wire fence. A tremendous crashing in the surrounding darkness caused the Old Timer to shout to Junior, "Say turn that head light over toward the fence, I believe there is a deer hung up in the wire," Junior swung his light around as crash after crash in the surrounding darkness told the hunters that not one, but several deer had come out of the swamp to feed on the grounds of the club. A wild shout of alarm from the Old Timer caused Junior to whirl around at the imminent risk of overturning the pirogue. "Turn off that light, boy!" he yelled, and Junior becoming confused instead of putting out the light, swung its rays straight into the yard. Full in rays of the head light a splendid buck came plunging straight for the flimsy boat with tremendous bound after bound.

Badly rattled, Junior only ducked his head and the big buck in one grand final leap jumped clear over the boat and hunters, his flying hoofs spurning Junior's shoulder as he cleared the boat and hunters and plunged with a tremendous splash into the canal. "Gimme the gun!" yelled Junior highly indignant at such scurvy treatment. "Don't shoot that buck boy, do you want to be fired for shooting deer over a head light?" roared the Old Timer, and Junior coming to his senses, held his fire as the buck swam to safety across the canal.

The two wardens took their kill up to camp, but said nothing to the "Boss" when they saw him again, of how the deer hunted the hunters.

Tung Oil Development Produces Additional Revenues

By J. H. SONDEREGGER
State Forester

ABOUT seven years ago, the Great Southern Lumber Company of Bogalusa, Louisiana, in studying the development of its cut-over lands for reforestation purposes, decided to experiment in planting some of its cut-over lands with Chinese tung trees. The Great Southern Lumber Company had phenomenal success with tung oil planting, and it acted as a pioneer for the adjacent area surrounding Bogalusa.

At present, the interests, under the direction of Mr. Lamont Rowland of Picayune, Mississippi, are planting tung oil trees on large acreages. During the year 1930, over four thousand acres were planted to tung oil trees and to complete ten thousand acres by January 1, 1932. Farmers both in Mississippi and Louisiana have followed the program of the Great Southern Lumber Company and have planted small patches of tung oil seed to see what they would produce. The Department of Conservation, through its Division of Forestry, recognized the value of the tung oil tree and in 1930 planted the seed to produce twenty-five thousand tung oil trees. These trees have been sold to farmers in all sections of Louisiana, and the tung oil tree has been developed in these regions during the past two years.

The tung oil tree produces a very oily nut. The oil is extracted and is used for lacquer paint and in a hundred and one other commodities. The oil is a very high priced commodity and has been obtained from China, but due to the crude methods used there, the oil never maintained its standard and each year's crop varied in color and grade. Consequently, the American paint industry became interested in the production of tung oil and started a development in Florida, the purpose being to produce a standard high grade of tung oil which would be uniform in grade and color each year. A great many landowners have become interested in this tree, but have been rather dubious as the outcome. The State Forester's office at the Department of Conservation has been asked frequently just what the guarantee of results would be from tung oil planting. The State Forester, after carefully examining all the results in the State to the present date, recommends that tung oil culture

will be very good utilization of a portion of our cut-over lands. It never will become a major tree in the state, as the larger portion of cut-over lands will be developed to forest trees and trees for the forest products industry. However, the tung oil tree may be planted by farmers and small landowners near manufacturing centers, and will in no way conflict with the general reforestation program.

Mr. Norman Core, Forest Ranger at Folsom, Louisiana, became interested in the tung oil tree and developed a small acreage on his little farm. Herewith is given a resumé of the results, clipped from the "St. Tammany Farmer," issued December 12, 1931:

"NORMAN CORE PROVES TUNG OIL TO BE A REAL MONEY PRODUCER"

"That tung oil is a paying crop in St. Tammany Parish has been proven by Norman Core, district forester at Folsom. O. G. Price, county agent, and Mr. Core weighed the tung oil seed from six-tenths of an acre of five-year-old tung oil trees and found the yield to be 1,483 pounds of seed. Reducing this to acre value gave Mr. Core a yield of 2,390 pounds at two cents per pound for oil, made a value of \$47.84. It cost about \$7.00 per acre for use of land and labor to produce the nuts. Mr. Core has sold his crop of seed for \$148.50.

"Over fifty persons visited Mr. Core's place to see his crop of tung oil seed when the annual tung oil tour was made September 30."

The Division of Forestry of the Department of Conservation has on hand about 16,000 tung oil seedlings which are for sale at varying prices from ten to thirty-five cents each, according to size. The Department of Conservation believes that it has fulfilled its purpose of developing the tung oil industry in the State of Louisiana and is not planting any more tung oil trees, as the development now is in the hands of the local nurserymen and landowners who are interested in growing tung oil.

For further information, upon application to the State Forester, care of the Department of Conservation, inquiries will be answered as to the possibilities of the tung oil growth and also as to the proper sites.

Conservation in the Department of the Interior

THE solution of the riddle of an over production of oil through an interstate compact making allocation possible, an increase of water yield from the public domain and its capture for use in the dry country, a release of public lands to the states, a working out of the Indian problem by weaning the red man from his reservation, the development of a much altered system of government in Alaska, revised methods of approaching the problem of the child, a rounding out of an already elaborate system of National Parks—these constitute problems of the people expounded by Ray Lyman Wilbur, Secretary of the Interior, and William Atherton DuPuy, Executive Assistant, joint authors of a book entitled "Conservation in the Department of the Interior," just off the presses of the Government Printing Office, in Washington.

The book emphasizes oil as constituting one of the Government's vital problems in conservation. Heretofore, it states, oil has been produced too rapidly and too wastefully. The United States with one-fifth of the oil of the world is yielding two-thirds of the world output. The record of all time for a waste of wealth has been broken in the past decade in the oil fields of the United States. In California alone, it is estimated, the loss in natural gas alone has been sufficient to have paid the national debt. The oil industry, in fact, has been at sevens and sixes. It has been a scramble, a madness. But there is a way out.

"The states should exert their authority to regulate oil production," the book holds, "they should themselves be responsible for holding production down to the point which would prevent waste. Working out this detail of control logically would lead toward unit operation and practical conservation.

"In June, 1929, a conference on oil production was held in Colorado Springs and the government's position was expressed in a statement which said that primarily, the responsibility for the handling of this oil problem lies with the industry and with the governments of the states. The position of the Federal government is not to interfere with the rights and duties of the local state governments, but to lend such aid as it can and to participate in the solution of the problems. This administration has no desire to concentrate the forces of government in Washington. It has

By RAY LYMAN WILBUR
and

WILLIAM ATHERTON DUPUY

A Discussion of a Vital Government Problem

every desire to cooperate with the states. The aims sought are uniformity of the conservation legislation and the uniformity of enforcement by some body, such as a joint commission. This

could be created by a simple compact of the states ratified by Congress.

"The industry was not at that time ready to come to this view of the problem. The possibilities that lay in action by the states were not then generally appreciated. When two years had passed, however, state action was admittedly the proper course in solving the problems of oil production, and strenuous action was being taken at many points."

The fact that the western one-third of the United States, an area 1,000 miles wide and 2,000 miles long, grapples always with the stern reality of a shortage of moisture, gives fundamental importance to the conservation of water in that area. Water, through irrigation, makes a bare four per cent of this West fertile. Ninety-six per cent remains a land of thirst which can be alleviated only through a development of and an efficient use of water. The overwhelming problem west of the 100th meridian is water. Conservation in that area must be based on such a handling of the public domain as to make it yield its maximum of water followed by the capture of that water before it runs uselessly to the sea.

A body of land as big as Texas, the book points out, still belongs to the government. A Public Lands Commission, appointed by President Roosevelt a quarter of a century ago, found that this area had been overgrazed, denuded, eroded and had ceased to serve its purpose. Decades have passed, yet nothing has since been done about it. Pointing to this record the book suggests a new setup for handling these lands—their delivery to and administration by the states in which they lie.

"When a state receives the government land," the book states, "a greatly improved situation will exist for handling it. The state should be able to bring about the proper use of all its grazing lands. Great benefits to its citizens should come about through the restoration of this land and its proper use for the production of grass and of maximum stream flow. The states are competent to so care for these lands as to get proper returns from them. The states, being close to

this problem, can adapt themselves to the varying requirements in different sections and work out individual solutions. It may be wise to put the responsibility for handling such situations on the states rather than to leave it with a distant Federal government.

"Montana is already in possession of about 5,000,000 acres of land—an area equal to that of New Jersey. It collects in rental and lease money about \$500,000 a year. There are 7,000,000 acres of government land, an area comparable to that of Maryland, within the borders of Montana. It is probable that an additional \$500,000 a year could be brought into the coffers of the school fund for Montana from these lands.

"Colorado in the last year for which figures are available, received \$642,000 in rentals for the surface rights of the 3,700,000 acres of state lands. She might get a comparable profit if she were to come into possession of 8,000,000 acres of government land still within her borders. Idaho got \$190,000 from the 3,000,000 acres of state lands. There are 10,000,000 acres that might be added to this area. Washington got \$315,000 from 2,400,000 acres and might add 1,000,000 acres to it. New Mexico got \$136,000 from grazing leases for 4,400,000 acres and might add 16,000,000 acres to it."

The book sketches many other of the vital problems of conservation that are handled by the Department of the Interior.

"With twenty-two national parks and thirty-four national monuments," it states, "variously distributed in regions where wilderness conditions are preserved, or where nature exhibits her strangest and most spectacular moods, or where the attraction arises from scientific or historic interest, this Nation may consider that it has made satisfactory progress toward the conservation of such areas for the generations that are to come. No other nation of the world has such a collection of park areas."

"Indians on reservation," this book on conservation states, "are habitually idle, distressingly poor, and consequently undernourished. They do not earn enough of the white man's money to keep themselves going. The Indian therefore must be given money-earning work to do. He must be put to work at the white man's tasks. The Indians are a simple and undeveloped people. They should start learning to make a living in the simplest way—by working for hire under direction for somebody else. They have a manual dexterity that is exceptional. They are fascinated by machinery. But they steadfastly refuse to be farmers. The Indian on the reservation is a communist. If he raises a crop of potatoes, the other

members of the band move in and eat them up. There is no incentive to personal endeavor, to accumulation of any sort. Indians should be led to establish themselves away from the reservations. Most of the reservations should disappear in two decades. Thousands of young Indians, after being educated in the government boarding schools are constantly being thrust back into the Stone Age life of the reservation and forced to submit to it. This is particularly hard on the Indian girls who, after 10 years in the boarding schools, where they slept between sheets, bathed, ate proper food, and learned the white man's standards of morality, find themselves driven back to the reservations to go barefoot, sleep on the ground, eat with their fingers out of the common pot, and perhaps, be disposed of for a price like any other chattel."

These problems of the people, magnificent in their sweep, and many others in the field of conservation, fall naturally to the Department of the Interior. The official publication setting them out is 253 pages in length, popularly written, contains no less than 200 photographs, and can be bought for \$1 from the Superintendent of Documents, in Washington.

THE GEORGE WASHINGTON MEMORIAL PARKWAY

(Continued from page 9)

The Old Chesapeake and Ohio Canal will afford recreation to lovers of canoeing, boating, hiking and swimming. It is part of the parkway program to reestablish the old canal so that its former picturesqueness with the tow boats will be preserved and the old tow path is to be put in good order. During nine months of the year canoes will glide over the waters of the canal and shoot the rapids below Great Falls. Already sail boats and motor boats are appearing in growing numbers, and as the waters of the river become easier of access, the recreational possibilities will be unsurpassed.

This parkway is to be the nation's parkway. It will be a monument to the first President, visioned and created to do him honor. It will also be for all those who love the out-of-doors and all growing things, and in addition it will hold ever before the American people the Potomac River with its richness in human history, its beauty of scenery, its pleasure and health giving possibilities and its urge to serve in the highest sense of the word, all the people of the United States.

Reforesting Abandoned Farms in New York

State Policy in Extending Woodlands and for Preserving Game and Fish Resources Described by Conservation Commissioner

THE State of New York has resources beyond—or before, as you may prefer—the wealth of its industry, the height and value of its urban structures and the riches centered in its banks. It has a great natural wealth in mountains, forests, lakes and streams, and in many broad and fertile acres.

Like the citizens of many other States the people of New York were rather late in realizing that this natural wealth ought to be preserved and developed for future generations, as well as made available for the present. Pride of possession is being supplemented by a new pride in conservation, in protecting and making good use of what Nature has provided.

We are perhaps too much accustomed to thinking of natural resources from the standpoint of their cash value—how much a forest will bring if it is cut down and shipped to market; how many horsepower can be developed at this waterfall; what value of minerals can be dug out of this mountain. We have not always considered how use can be combined with preservation and what real losses may come from reckless waste. Now we have begun to regard other uses not convertible into terms of ready cash, but representing nevertheless incommensurable value.

Along with explorers from other States in the Union, I have been discovering the State of New York in the last few months, and I have been surprised, not to see how great the waste of uncurbed exploration of our natural wealth has been, but to see the magnitude and the grandeur of what remains. I am not speaking now of timber wealth in terms of board feet, nor of undeveloped horsepower, though the State has both of these in considerable quantity, but of assets more real and lasting that will make our commonwealth a livable and enjoyable habitation for many generations to come. I am inclined to think that the "tangible," cut-down-and-burn-up values of natural resources will grow less and less significant and important as the years go on and civilization advances and that the so-called intangibles will

By HENRY MORGENTHAU, JR.

Conservation Commissioner,
State of New York

become more and more real and significant.

The State has been protecting its forest resources diligently for several years. It has acquired more than 2,000,000 acres of timber in the Adirondacks and Catskills, which it has locked up tightly against despoilation, creating permanent, untouchable forests. It is protecting these forests against fire and disease at an expense probably not at all justified by their lumber value, either present or future.

Lumber value, as even the simplest mind is now beginning to grasp, has little to do with the matter. These forests are needed for protecting water supplies, regulating the flow of rivers, and above all for standing and being just what they are—beautiful, natural mountain woodlands for the perpetual enjoyment of the people of the State and their visitors.

In these forests, whose wildness and natural beauty are amazing to those explorers of whom I have spoken, and who come from newer States and older lands, the State has developed, and is continuing to develop recreational facilities. Wherever it can be done without marring the forests, public camping areas have been developed, and are being extended. Trails have been built, and trail shelters erected.

So far as possible without endangering the great capital asset of the forests themselves, they are being made available for recreation. Which means, that the people of the State are being given an opportunity to enjoy their home, and to extend hospitality to their guests.

I am of the opinion that what is called the recreational use—but what might be called simply the living value—of our outdoor assets will come in the future to be regarded as their chief worth. For my part, I'd like to see them more fully enjoyed by all classes of our people.

Most people know that the State of New York has a great resource in the fertile agricultural lands that make up a high proportion of its total area of some 30,000,000 acres. Early settlers

found the great Hudson and Mohawk valleys a smiling and fertile land, and they proceeded to seize the Indians' corn-patches and to drive the redskins out with as much despatch as possible.

Those valleys and other valleys and plains in the State are still fertile, and are producing agricultural returns that place the State well up among the leaders—normally sixth or seventh in value of agricultural production among the States in the Union. This rank is being maintained in spite of the fact that yearly, for some years past in the neighborhood of 250,000 acres have been abandoned for farm uses annually, and the land turned back to a state of wildness and uncultivation.

It will be surprising to many people to know that there are in the neighborhood of 4,000,000 acres in the State once agricultural land that have been abandoned and have no commercial use—this in the most populous State in the Union, where one might think that land would be scarce and dear. Why was this land once used and why is it not used now?

The answer is found in progress and efficiency. Machine farming and better transportation combined with greater general agricultural efficiency have made it unprofitable to use poor and hilly land for growing crops.

But there is an exception as to one crop. Timber can be grown on this land, for generally timber once grew on it. So the State of New York has embarked on a program of buying back 1,000,000 acres of this land and planting trees on it—recreating a natural resource that has been used up. When that 1,000,000 acres has been reforested—and it is estimated that will be accomplished within 15 years—then the people of the State may want to acquire still another 1,000,000 acres for the same purpose.

An immediate use has been found also for these reforestation areas. It seemed to me that they could well have a present recreational value and so they have been made public hunting grounds, and where they contain lakes or streams, these are being surveyed and stocked with game fish.

Wild life, of woods and water, it will be noticed, is regarded in New York as a natural resource to be conserved and increased if possible. A part of the conservation program, and not an inconsiderable part, is that of protecting and adding to the stock of birds and beasts in the covers of the State. Pheasants in great numbers are being bred and liberated, and quail are being added to our program—the native bob-white whose call used to be heard in all corners of the State.

A dozen fish hatcheries and as many rearing stations assist nature in the State in the work of maintaining this natural resource so that anglers can continue to have their sport. A tabulation of the State's game take for a year, showing such items as 7,000 deer, 285,000 muskrats, 350,000 rabbits, 200,000 pheasants, besides bear, bobcats, opossums, otter, mink, sable, red and gray foxes, and 75,000 skunks taken for their pelts, contrasts rather oddly with notions of New York as merely an urban State.

The State has shown its attitude toward scenic beauty as an asset and recreation for the people in natural surroundings as an activity worth fostering by embarking on a great program of development of rural parks. From the proceeds of a bond issue of \$100,000,000, and from annual appropriations, suburban and woodland parks, more than 70 in number, and in 10 administrative regions extending from Niagara to Long Island, have been developed and are being extended. Many of these have been centered on natural locations of great scenic beauty, such as forested mountain areas in the Alleghany region, Taughannock and Buttermilk Falls and Enfield Glen, the Finger Lakes region, the gorge of the Genesee, the Berkshire Hills on the eastern border of the State and the shores of Lake Erie and Ontario.

The health-giving, the recreational, the esthetic and the spiritual values of New York State's outdoor resources have thus been asserting themselves in recent years and have come to be regarded by many as of prime importance. More and more of the State's area is thus being made available to all as a common country estate. This may be merely anticipating the day when the trend will be away from urban living, and more of us will find a way to combine with the advantages of modern life, the joys of a country habitation for a greater proportion of our time.

CLOUDS

*The clouds are God's material
With which he paints the sky,
And colors with glorious sunshine
When the day begins to die.*

*Our lives are just a canvas
Where service, love, and duty,
Through the alchemy of God
At last give forth their beauty.*

*As a glimpse of glory at sunset
Is the goal of the cloudy day,
So the smile of God's approval
Makes bright our narrow way.*

—J. D. STAGG, Longville, La.

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Wild Life Conservation in Minnesota

Provision of Food and Cover for Game

THE new Minnesota Department of Conservation is taking hold of a big job. It

has been given charge of the timber resources in Minnesota, the mineral resources, the public waters, and drainage problems, the lands, and the wild life of the State.

For administrative purposes the Department has been divided into four divisions, each with a director in charge. These work under the Commissioner of Conservation.

Problems of immense importance to the State of Minnesota confront each of these divisions, but since this is written in the middle of the hunting season, I am going to confine my discussion to some phases of wild life conservation.

The introduction into Minnesota of English or Ringnecked pheasants has proved to be a wonderful success. These beautiful birds have increased rapidly, and are now the most important of our upland game birds. They stand our winters well, are good rustlers for food, and in turn provide excellent sport and a choice table delicacy. This year a 10-day hunting season for ringnecks has been authorized with a daily bag limit of three birds, one of which may be a hen.

The Hungarian or gray partridge introduced into Minnesota quite recently is another fine upland game bird. It is somewhat on the order of our quail, but larger. The Hungarian partridge is a prolific breeder and where conditions are favorable has increased in numbers remarkably. Many thousands of dollars were subscribed by the sportsmen of the state to introduce this splendid bird. The Hun, as this bird is commonly called, is of a grayish color which makes it a little difficult to distinguish against a background of dead grass and autumn foliage. It flies swiftly and when hunting is permitted, it is going to test the hunters' marksmanship much more strongly than does the ringneck pheasant. The Hungarian partridge lies well to the dog and in this way may to some extent take the place of the prairie chicken, especially for hunters whose chief enjoyment in the field is to see their dogs work well on birds. The ringnecked pheasant, of course, on account of its swift-running habits, does not lend itself to hunting with the aid of dogs.

The quail or bob-white has been the subject of much discussion among sportsmen and others.

By W. T. COX
Commissioner of Conservation,
State of Minnesota

This bird is an attractive little fellow and we all like to hear him calling from fence corners

and brushy hillsides. The quail is suited only to a part of Minnesota, principally in the southern and eastern portions of the state. Even there they do well only where they have suitable cover and where they are taken care of to some extent, during hard winters. Sleet storms are particularly deadly to quail and it is advisable after such storms and even after heavy snow storms that groups of quail be hunted up and fed for a time. The sportsmen of southeastern Minnesota have expended thousands of dollars in purchasing quail from other states, to stock certain counties after particularly hard winters. They have also spent a good deal of money in organizing and conducting feeding campaigns.

Quail have an unfortunate habit of bunching up, thus making them more noticeable to their enemies. From studies made it appears advisable that the big coveys or bunches be broken up and the birds scattered. The remaining birds then have a better chance to survive the winter and the danger of inbreeding is avoided.

The prowling house-cat is probably their greatest enemy. Hawks and owls, gray foxes, and weasels are also destructive to quail. A shortage of suitable cover however is probably the greatest drawback to this bird. The annual burning of brush and grass lands and the over-pasturage of brushy hillsides make conditions very difficult for the quail, since their nests are burned and the mother bird often destroyed by the fires, and even if they escape such fate they are left without protection from their enemies in the air and on the ground.

Farther north in the State, we have every reason to believe that the prairie chicken and the sharp-tailed grouse can be so managed through hunting regulations that they will increase rather than decline in numbers, and thus furnish good sport to the farmer's boy and the village sportsmen in the northern half of Minnesota. The prairie chicken thrives best in the opener areas and is typically a bird of the prairies. The sharp-tailed grouse prefers brush country and has increased rapidly in some of the swamp and muskeg areas.

(Continued on page 37)

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THE BLACK DRUM

(Continued from page 19)

tinnet spawning migration of the adult ripening fish takes place from the various bays and lagoons to the Gulf of Mexico where spawning occurs. This movement from the bays, occurring principally from late January through March, in the vicinity of Corpus Christi, Texas, gives rise to a short seasonal fishery which is conducted by means of anchored gill nets set near the entrances to the various bays to intercept the migrating fish.

The larval or young drum come into the bays in great numbers through the passes and make their way to shallow bays and lagoons where feeding conditions are probably most suitable to the young fish. The adult fish after spawning re-enter the bays also, although drum of all sizes from 4 inches up, may be caught in moderate numbers along the beaches in the Gulf of Mexico at all times of the year.

On the basis of scale and length-frequency studies, it appears that the black drum reaches an average length of about 10 inches by the end of the first year; 14½ inches by the end of the second year; 16½ inches by the end of the third year, while a fish about 27 inches long may be approximately 7 years old. A commercial size is reached by the end of the first year, and the fish are hardly desirable for food after the third year, since the flesh tends to become coarse and may be infested with parasites which reduce its marketability if not its wholesomeness.

Sexual maturity is usually attained at the end of the second year. The large drum are exceedingly prolific, a female 44 inches long, taken near Corpus Christi, Texas in March, 1927, yielded from four to five million eggs in nearly ripe condition.

The scales of the drum find a unique application in the manufacture of "fish scale jewelry" to be seen in Florida, their fine lustre and hardness rendering them adaptable for this purpose. So firmly are the scales attached to the fish that an ax or a hatchet is necessary to remove them.

The fact which gives the fish its name is its ability to make a loud drumming noise under water. Some specimens kept in the New York Aquarium for a number of years could be heard all over the building. Concerning this curious habit, Mr. A. W. Roberts, former director of the Aquarium, facetiously remarks: "Often when dredging at night time at Princess Bay, Staten Island, I have heard the constant drumming of the drum, at different points about my boat; they were evidently having a big oyster supper."

The drum is usually caught in haul seines incidental with other food fishes, although many are taken in pound nets along the Virginia coast. With the channel bass or red drum it frequently offers good sport to surf fishermen, especially off the New Jersey coast.—*Issued by Department of Commerce, Bureau of Fisheries, Washington, D. C.*

WILD LIFE CONSERVATION IN MINNESOTA

(Continued from page 35)

There are three good reasons why we must conserve our game birds, such as the pheasant, the Hungarian partridge, the quail, the prairie chicken and the sharp-tailed grouse. All of the people of Minnesota enjoy seeing these birds under natural conditions and we get a thrill as they rise from the grass or brush at our feet with an explosive sound and a musical whirr as they speed away. The outdoors would be much less attractive to us if we could not occasionally glimpse some wild game birds, even though we may not want to shoot them.

The agriculturist has the strongest of reasons for wanting these birds on his land. He and his boys are more than likely to be sportsmen themselves in a limited way as time permits; but more important still, the farmer needs such birds on his place to hold down the hordes of insects that otherwise would make serious havoc with his crops.

EXCUSE IT, PLEASE

Beneath the grassy mound now rests

One Edgar Oscar Earl,

Who to another hunter looked

Exactly like a squirrel.

—*Philadelphia Inquirer.*

And under this—a lonely pile,

Lies Rufus Rastus Babbit;

He looked the part, a gunner thought,

And shot him for a rabbit.

—*Cincinnati Enquirer.*

Beneath this weeping willow tree

Lies Edward Everett Bier,

Who, by another hunter, was

Mistaken for a deer.

—*Buffalo News.*

Big Duck Area Will Be Given Back to Birds

To reclaim from civilization and give back to wild birds "the chief waterfowl supply depot of the western states," is the expressed objective of an organization recently formed by western sportsmen with headquarters at Boise, Idaho. The Pacific Coast Migratory Bird Conservation Association has set out to enlist 400,000 sportsmen in raising \$1,270,000, with which to purchase 129,000 acres of irrigated land owned by L. H. Swift, the packer, along Blitzen River, and adjacent to the Malheur Lake federal bird refuge in east central Oregon.

This area and Malheur and Harney lakes in the Donner and Blitzen Valley formerly produced hundreds of thousands of wild ducks, geese and other wild fowl, and formed the hub of the great waterfowl flights for western states, according to officials of the American Game Association, which is supporting the plan.

The Boise sportsmen declare that for ten years the lakes have been receding gradually, and the entire region is today almost negligible as a waterfowl producing area. Harney Lake is now dry and Malheur Lake is one-tenth its normal size.

The main reason for this, the sportsmen report, is the diversion of most of the water from Blitzen River, the principal source of supply for Malheur Lake, for purposes of irrigation. If the organization succeeds in saving the region for migratory birds it means to deed the land to either the Federal or State government for administration as a refuge for all time.

Dr. R. R. Towle of Boise first conceived the restoration idea. He is secretary of the new organization. M. L. Hibbard, president of the Idaho Power Company, is president, and there are 20 directors. These have suggested that interested sportsmen of other states select two bankers or other responsible men for each state to act as a finance committee in raising the money.

The most significant thing about this undertaking, officials of the American Game Association say, is the fact that the sportsmen of the West, who will reap the principal benefit, are themselves going to raise the funds for this waterfowl restoration program instead of waiting for the Federal Government to do it. Success in this undertaking will be looked upon as the best evidence possible that the sportsmen alone can restore the hundreds of smaller breeding areas.

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State Development of Forests in New York

This division of lands and forests has charge of the administration of the Forest Preserve and of all State parks and historic sites coming within the Sixth Park Region, which includes the 16 Adirondack and Catskill counties, and also the counties between the Adirondacks and the Catskills.

The Division has charge of all forestry activities carried on by the Conservation Department. This includes:

1. Forest fire control, for which an organization has been established and is maintained, giving intensive fire protection to the Adirondacks and Catskill fire towns aggregating 7,500,000 acres. A less intensive organization supervises forest-fire control work in the so-called "Fire Districts" established by the Conservation Department. These districts embrace 9,500,000 acres, including Long Island, the area east of the Hudson River, the territory south and southwest of the Catskills, and the counties of Allegheny, Cattaraugus, and Steuben, in the southwestern part of the State.

2. Reforestation, including the operation of five forest-tree nurseries with an output of 40,000,000 trees per year; the planting of trees on State Forest Preserve land and on State reforestation areas in connection with the Hewitt reforestation program; the distribution of trees free to counties and municipalities and at cost of production to owners.

3. Acquisition of lands for the Forest Preserve at the rate of about 30,000 to 40,000 acres per annum, and for the State reforestation areas at the rate of about 40,000 acres per annum.

4. Forest-pest control, including suppression of the gypsy moth and control of the white pine blister rust, together with other lesser insect pests and tree diseases.

5. Recreational development of the State Forest Preserve, including the establishment and operation of public camp sites with a daily capacity of 30,000 campers and the upkeep and maintenance of 500 miles of trails in the Adirondacks and Catskills.

6. Forest investigations for the gathering of necessary information for the guidance of the Department in its nursery operation, reforestation and pest-control activities.

7. General forestry work, including the giving of advice in forestry to landowners, administration of State forests and publication of bulletins and reports on forestry and State forest activities for the information of the public.

FIELDS

*They have slept under sheets of snow
And dreamed of the coming spring
When the touch of man and beast and tool
Brings a sudden awakening.*

*They have known long hours of idleness
And the comradeship of grain,
They have felt the thrill of furrow and plow
And the desolate kiss of rain.*

*They have shared the joys of bursting seed
Heeding the sun's noon heat
And lulled by the evening wind's low voice
Watched twilight and noonlight meet.*

*They have spanned the years with willingness
For sowings and reapings and rests,
They have cradled many a bounteous harvest
On their billowy, beautiful breasts.*

*They are spread o'er the face of the world
Awaiting the need of each man
They are old Nature's loyaldest children
And a part of God's marvelous plan.*

—GRACE TARLETON AARON.

STATISTICS COMPILED ON GAS MATERIALS

Statistics compiled on principal materials consumed in gas-making by the Census of Manufacturers show that gas plants use more than 8,000,000 tons of coal and 20,000,000 barrels of oil annually. In 1929 the gas-making plants consumed 68,072 long tons of anthracite and 8,917,607 short tons of bituminous coal, and their consumption of oil amounted to 20,707,660 42-gallon barrels. In addition to these materials the gas-making plants also consumed 2,471,555 short tons of coke and breeze.

For census purposes, this industry covers all establishments, both private and municipal, engaged primarily in the commercial manufacture of gas to be delivered through mains, for illuminating, household and industrial purposes. It does not include establishments which merely distribute gas not of their own manufacture. Blast furnace gas, and with a few exceptions, gas resulting from by-product coke oven operation, are not treated as products of the industry. A considerable amount of by-product coke oven gas is, however, purchased by commercial gas plants and used as an ingredient of manufactured gas.

The products of the gas industry comprise not only gas, but also the by-products resulting from its manufacture, such as coke, tar, ammonia, naphthalene, and light oil and its derivatives.

The total output of the 754 gas plants in 1929, as shown in the Census of Manufactures report, amounted to 408,401.395 thousand cubic feet, and was valued at \$438,242,970.—*Issued by the Bureau of the Census.*

Get Winged Bird, "Use Retrievers," Urge Sportsmen

Don't waste a bird. Get the cripples and, if possible use a retriever while duck hunting this fall, urges the Izaak Walton League in a recent game bird bulletin which stresses the annual waterfowl loss each fall, due to the fact that some hunters are careless about going after crippled birds, which ought to be secured and included in the daily game bag.



The use of a good dog to retrieve ducks is a conservation measure, says the Izaak Walton League in urging sportsmen to get winged birds, and not to let a duck go to waste this fall. Above is Fort Qu'Appelle Queen, an Irish water spaniel, who has just retrieved a canvasback for her master.

It is pointed out, that thousands of waterfowl are lost each fall because a certain percentage of the shooters make little or no attempt to get slightly wounded birds. Many of these could be secured by the use of a good dog or by quick work on the part of the hunter. The true sportsman never lets a winged bird get away, if he can help it, says the conservation director of the Walton organization, and this fall, with none too many flocks of ducks coming down from the north, all waterfowl hunters are asked to observe the "don't waste a bird" slogan.

CATCHES MOUTHLESS FISH

J. W. Jones, fisherman, of Newport, Ark., caught a German carp in the White River. It had no mouth and was believed to have obtained food through its gills. Incidentally, Jones caught the fish with a net.

The use of a retrieving dog is a conservation measure which is especially valuable at this time, says the League as it praises the faithful Chesapeake Bay, the merry cocker and springer spaniels, reliable English Labradors, and hard working Irish water spaniels, which swim in icy water, and crash through sloughs to pick up "down" birds for their masters.

THE WOOD TRAILS

*The wood trails are free trails—they take no traveler's toll;
A green way, a clean way, they go by hill and hollow.
You know their sudden summons by a hunger in your soul,
And wit to rise at break of day and follow, follow, follow.
Your fare is berries ripe and red and wild grapes brimming over,
And crystal waters cold as snow in two palms for a cup,
Your bed at nightfall balsam boughs with wide, star-tufted cover
And sleep as deep as tranquil wells until the dawn comes up.*

*The wood trails are fair trails—at every dip and turn
The byways, the shy ways, are set with lovely wonder;
The lightest question step will leave a footprint on a fern,
The grayest gnarled and ancient oak has violets nodding under.
And whether quick to amber brooks with beryl bubbles breaking,
Or dim and slow through churchly pines, the little pathways go,
There's beauty for a lifted glance and treasure for the taking,
And certain secret old delight that only wanderers know.*

*The wood trails are long trails, mysterious and sweet—
A far way, a star way, they set a pilgrim faring;
And strangely, as you go the shoes are swifter on your feet,
The old-time burden on your back is lighter for the bearing;
While here a bough is blossoming and there a bush is burning,
And every hour's a singing bird for every mile you roam . . .
And best of all—most blest of all—with never backward turning
The wood trails, the good trails, they lead your spirit home!*

—NANCY BYRD TURNER.

IRIS

By CARMELIA PIGRATA

Tall, graceful,
Mingled with the sap of life,
A tinge of color,
Graceful, windbent, natural sight,
They wave a light feather's kiss into the air,
And to that irrepressible suitor, wind,
Cry—"Here Take it. Carry it on!"
And bow down their heads in heavenly submission to earth,
I am yours—
Iris

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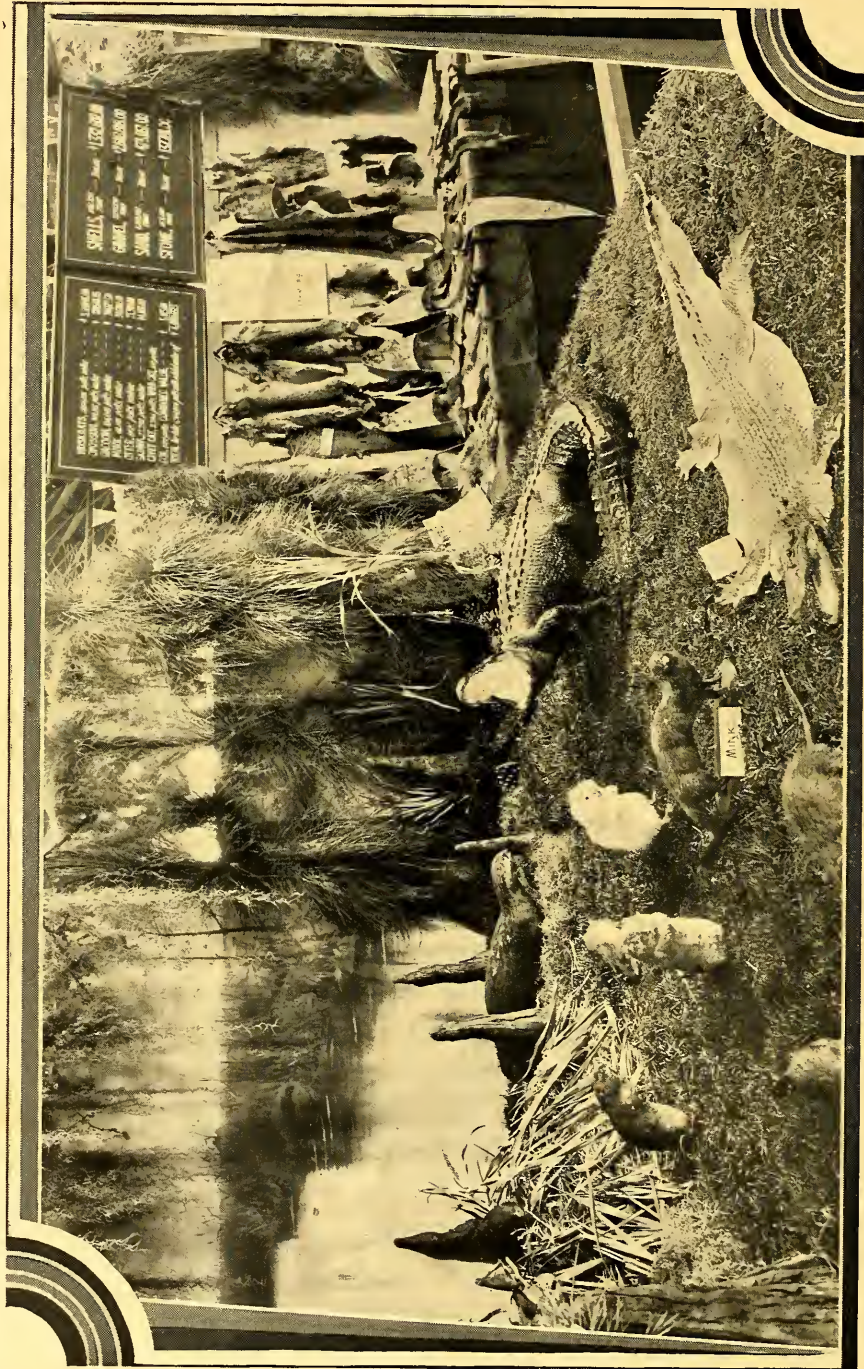
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